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STEEL

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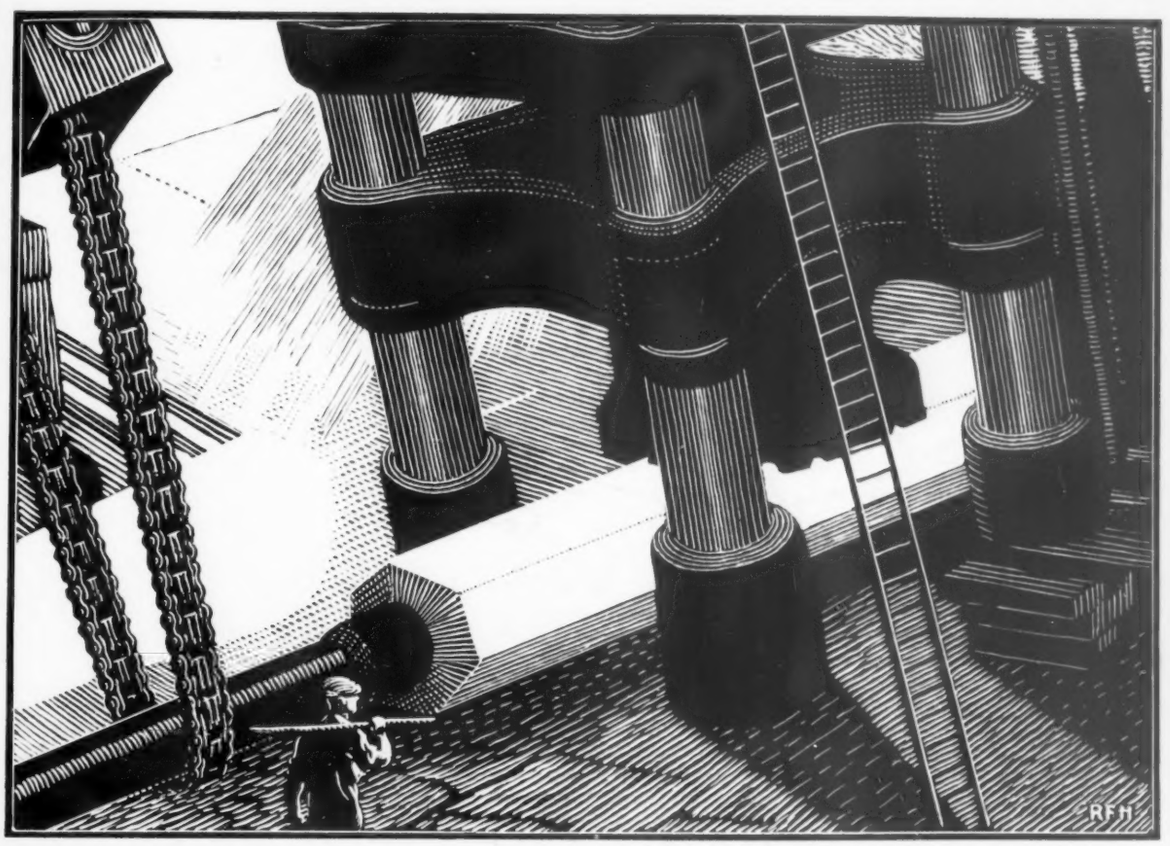
FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

AUG 19 1935



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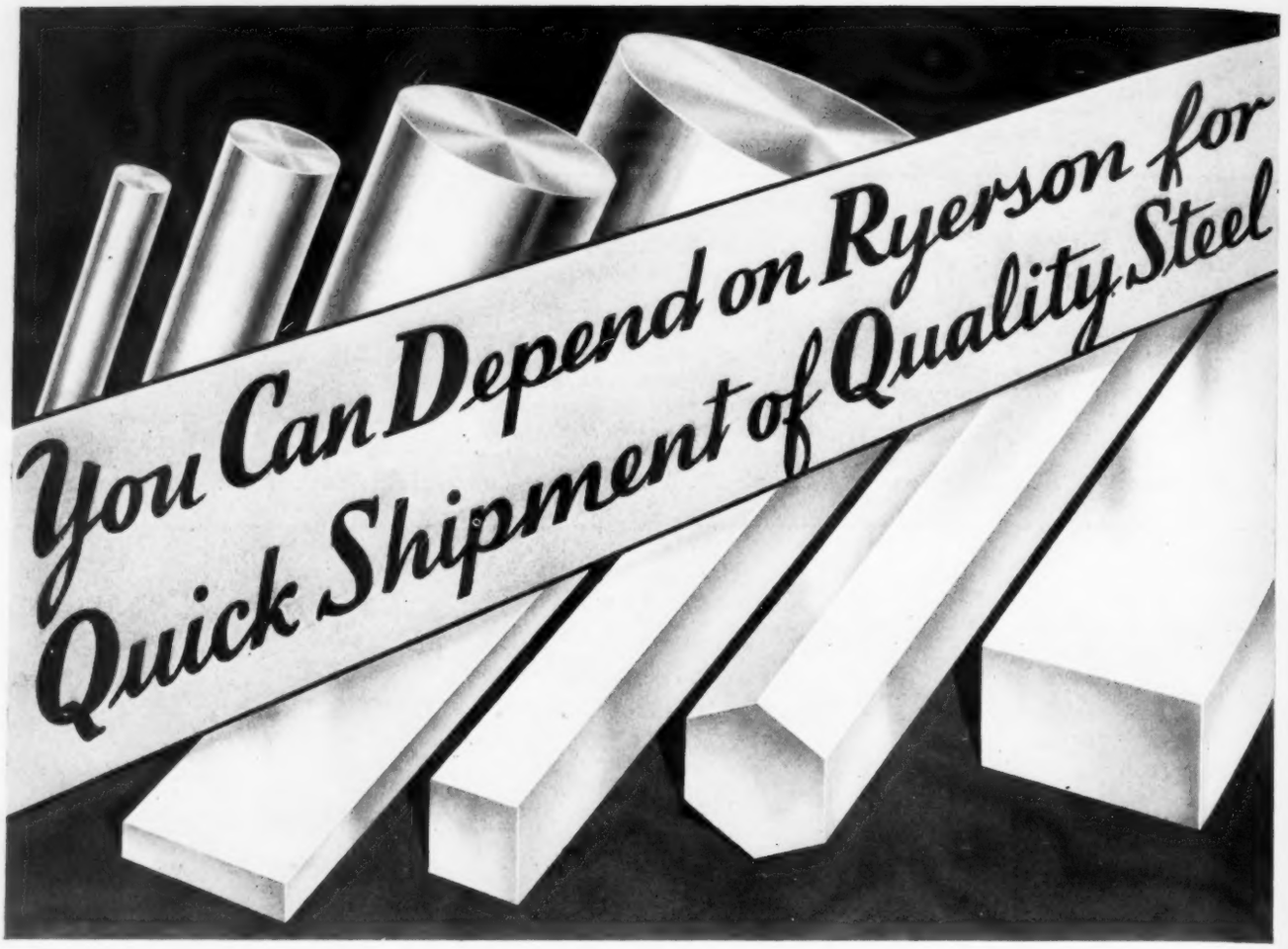

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As the Editor Views the News

THE long awaited adjournment of congress may occur this week. When the final stroke of the gavel sounds the end of this hectic session, it will be worth something to everybody to know that for several months there will be a respite from annoying legislation. Members of the present congress now can go home with the dubious distinction of having passed more indigestible, unworkable and unconstitutional legislation than has ever been written in any previous session. Most of the new laws may seem highly desirable to new dealers, but to the nation as a whole they will spell a chronic headache.

• • •

Doesn't Look So Good Now

Consider a few of the recent legislative masterpieces. The Wagner labor disputes bill—lovingly christened by William Green as "labor's Magna Charta"—was rushed through house and senate at express speed to meet what its sponsors declared was a serious situation resulting from the abandonment of Section 7a of NIRA. Notwithstanding the alleged urgency existing early in June, President Roosevelt in mid-August (p. 14) has not yet named members of the labor board created by the Wagner act. Also, union labor leaders are not as enthusiastic about this legislation as they were before it was enacted. Possibly it bites off more than can be masticated.

• • •

Haste Here Makes Waste

Then there is the social security bill. Everybody grants that the idea of unemployment insurance and old age pensions is sound. But in their zeal to get something started, the new dealers pushed through a hastily prepared plan which in the end probably will actually retard the progress of this country toward real social security. We shudder to think of the reaction of the public when, some half dozen years from now, it learns what this plan will cost and realizes who will bear the burden. By 1938 the tax for unemployment insurance will be adding about $1.05 a ton (p. 11) to the cost of steel. Long before that time the man in the street will have decided that the new dealers have loaded here and there far too many additional per cents onto his cost of living. A thorough study of unemployment insurance and pension plans should have been made before the plan was translated into law.

• • •

Business Still Forging Ahead

Business improvement is more positive than a week ago. Steel operations (p. 12), which seven days ago seemed to be near a peak, mounted three points to 51 per cent of capacity. Automobile output, which had been sharply reduced for two weeks (p. 17), advanced from 48,067 to 56,386 units. Lake Superior iron ore operators have revised their estimates of the season's shipments (p. 10) upward by 1,000,000 tons to 27,000,000 tons. This is the greatest tonnage since 1930. The index of machine tool orders for July (p. 20) leaped to 119.8 from 91.1 in June. The three-month moving average for July was 94.7, compared with 76.7 in June. Unfilled orders are mounting.

• • •

What Is Key To Profits?

To those who are curious as to why some companies have fared much better than others during the depression, the analysis of some of the characteristics of National Steel's setup (p. 13) should be enlightening. Location, cost of assembling materials, overhead, balance of productive capacity and relation of products to demand during the depression are important factors . . . . Manufacturers who employ welding equipment will do well to weigh this statement (p. 40) carefully: "Every hour an obsolete arc welder is operated, it wastes at least 30 per cent of the operator's time, 14 per cent of the electrodes used and 10 per cent of the power consumed." . . . Another line worth considering — particularly under present conditions — is (p. 41), "He who would make money must begin by spending."

E. L. Shaner

To Bring Down Million Tons More Ore, Cut Dock Stocks

AS A RESULT of the unusually strong midsummer demand for iron and steel, prospects for larger shipments of Lake Superior iron ore appear brighter—in fact, the outlook is the best in five years.

Producers preparing for fall operations now estimate that 27,000,000 tons of ore will be shipped this year, which is an increase of 1,000,000 tons, or about 4 per cent, over their highest estimate earlier in the season. If attained, this figure will be 23 per cent over the tonnage shipped last year.

More important, from their standpoint, the increased consumption indicated for this fall, winter and next spring will give both producers and consumers an opportunity to reduce stocks such as they have not experienced since pre-depression years.

Stocks Still Heavy

Stocks at lower lake ports and furnaces Aug. 1 were approximately 29,300,000 tons. Up at the mines they still are about 10,000,000 tons. Stocks at lower lake ports and furnaces a year ago amounted to 29,961,000, so that despite the heavier consumption this year they have not been materially reduced.

Since 1929 these stocks have been well above 30,000,000 tons as of Aug. 1, except in 1933 when they were reduced to 27,700,000, following a year in which shipments were held down to 3,500,000 tons, lowest in 50 years.

The first consideration now, as steel demand is unusually well sustained for the summer, will be to reduce these stocks, which would be considered excessive even for normal years. Stocks, as large as they may be, are never evenly balanced. For this reason producers do not look for an important bulge in shipments during the fall months, but for a moderate increase, designed mainly to round out stocks.

The number of new commitments for iron ore in lots from 25,000 tons to 100,000 tons, therefore, has been increasing.

The number of blast furnaces in operation July 31 was 92, a net gain of one during the month. Since then three more steelworks stacks in the Pittsburgh district, and one at Cleveland have been lighted. In the Buffalo district, the Tonawanda Iron Co., subsidiary of the American Radiator & Standard Mfg. Co. has been blown in, and started to consume 200,000 tons of iron ore, which was ordered early this year. The Ford Motor Co. may purchase additional iron ore in the fall.

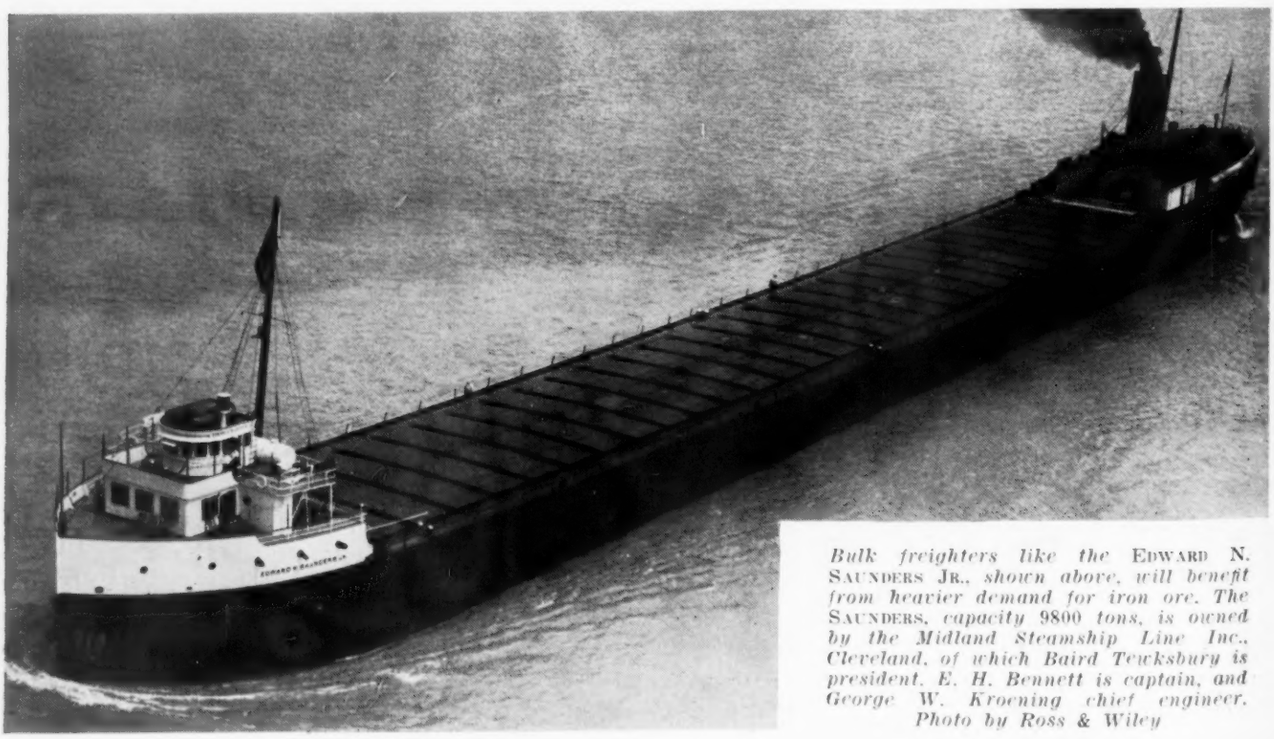
The United States Steel Corp., through its Great Lakes vessel subsidiary—Pittsburgh Steamship Co.—has not and does not have at present any intention of altering its ore shipping schedule for the season. It is operating 42 of its 86 vessels. Last year it shipped 8,755,000 tons of iron ore, and in the year preceding, 8,501,000. The tonnage it expects to move this season is not disclosed, although it will be up proportionately with the total estimate of 27,000,000 tons.

Lake Superior Ore Shipments

	Tons
1926	59,970,000
1927	52,344,000
1928	54,856,000
1929	66,157,000
1930	47,188,000
1931	23,496,000
1932	3,587,000
1933	21,672,000
1934	22,064,000
1935 (Estimated)	27,000,000

No Plans for More Boats

Next in size is the Interlake Steamship Co., subsidiary of Pickands, Mather & Co., now operating 20 of its 49 carriers. Neither this company nor any of the other large transportation companies have any definite plans for bringing out more boats this season. There is considerable flexibility, however, and a marked increase in demand for ore could be met with the present number of active carriers, especially so as the lake level now is higher than in



Bulk freighters like the EDWARD N. SAUNDERS JR., *shown above, will benefit from heavier demand for iron ore. The* SAUNDERS, *capacity 9800 tons, is owned by the Midland Steamship Line Inc., Cleveland, of which Baird Tewksbury is president. E. H. Bennett is captain, and George W. Kroening chief engineer. Photo by Ross & Wiley*

the earlier months, and the draft has been raised four to five inches.

The Bethlehem Transportation Corp. has nine vessels in operation, three more than a month ago. On the other hand, one of the smaller interests has taken out of commission its one boat.

The net change is an increase of five over the 159 vessels in commission July 15, or 164 in service. This happens to be exactly the same number active on June 15. It is 26 less than were engaged on July 15, last year, although at that time not all of the 190 were carrying iron ore, but coal and other freight, as well.

Some of the boats now in service are not carrying iron ore each trip down the lakes, but can be swung over any time—this being the main reason shippers do not expect any substantial gain in the number of active boats over the remainder of the year.

Actual shipments of iron this season to Aug. 1 amounted to 12,600,029 tons, or 9.3 per cent more than in the comparable period last year. In July this year 4,460,500 tons were brought down the lakes, and preliminary figures indicate a similar tonnage, or slight gain for August.

Won't Hazard Guesses

Partners in one of the leading iron ore mining and shipping companies at Cleveland were seated around the table at one of the their regular "morning meetings" last week, and the talk turned to the probable total of ore shipments this year. Not one would hazard a guess—beyond the general estimate of 27,000,000 tons.

"Tell us what pig iron and steel will do over the remainder of the year, and we will tell you how much iron ore will be shipped," said one to this writer.

"All we know is that the outlook is better than at any time in five years, and if conditions continue to improve, some iron ore consumers will need considerably more material. Others will not. It is all a matter of stocks. If in September and October prospects for a brisk winter demand are in evidence, ore shipments will be promptly increased."

Transportation

INLAND STEEL CO., Chicago, has filed suit in the federal court of that city asking an injunction against both the interstate commerce commission and the Indiana Harbor Belt line railroad prohibiting them from enforcing an order of the commission preventing the granting of switch rebates. The practice is one in which railroads pay large shippers for switching done by shippers in their own yards.

Unemployment Levy at Start To Cost Steel $11.09 per Employe, 35c per Ton

FORMAL signing of the social security bill by the President Aug. 14 launched iron and steel, with all other industry, on a program of unemployment insurance beginning next Jan. 1, and old age pensions and annuities beginning a year from January—provided the bill is not declared unconstitutional by the courts in the meantime.

Unemployment insurance is predicated upon a 1 per cent payroll tax beginning Jan. 1, 1936, followed by a 2 per cent tax in 1937, and a 3 per cent tax in 1938 and thereafter. This tax will be levied on employers of eight or more persons.

On iron and steel, unemployment insurance imposes this burden. In June, the last month for which American Iron and Steel institute statistics are available, the total steel industry payroll was $41,902,874. One per cent of this would be $419,028, or at the annual rate of $5,028,336. June, incidentally, was a 40.31 per cent steel month and a 37.2 per cent pig iron month.

For another comparison take 1927, which was a 75 per cent steel year. One per cent of the payroll of iron and steel producers that year would have been $12,640,000, while 1 per cent of the machinery and allied industries would have been $12,877,780 additional.

For a specific example, take the United States Steel Corp. for 1934, which was a 37.38 per cent steel year. One per cent of the Corporation's payroll of $210,503,533 would have been $2,105,035. Since the Corporation averaged 189,881 employes last year, this would have been $11.09 per employe paid into the federal treasury. In 1934 the Corporation produced 6,004,585 tons of finished rolled steel products for sale, hence a 1 per cent impost for unemployment insurance would have averaged 35 cents a ton. The Steel corporation represents about 39 per cent of the industry's capacity.

For the burden imposed on the industry and the Steel corporation in 1937 the above figures should be multiplied by 2, and for 1938 and thereafter they should be tripled.

Credit on State Tolls

For their contributions to state unemployment funds, manufacturers will receive credit up to 90 per cent of the total theoretical federal impost, hence the preceding totals are accurate no matter what the volume of state participation is. An unemployed man cannot be denied compen-

First Stage in the Life of an Automobile

A tilting open-hearth furnace at the Ford Motor Co.'s Rouge plant, at Dearborn, Mich., is starting steel on its way to the assembly line, where it will emerge as a shiny new V-8. Ford steel furnaces produce about 100,000 tons a month. From the ladle shown being filled, four ingot molds will be bottom-poured at one time

sation on the ground he refused a job where a strike was on, or refused to accept terms less favorable than those prevailing in his locality, or for refusing to participate in a company union.

Old age pension levies descend upon industry beginning with 1 per cent in 1937 and increasing to 3 per cent in 1949. The contributions of employers will be matched evenly by deductions from employes. These old age benefits vary from $10 to $85 a month.

Thus, assuming that the constitutionality of the social security measure is sustained, the steel industry beginning Jan. 1, 1936, will pay 1 per cent of its payrolls into the federal treasury.

In 1937 it will pay 2 per cent of its payrolls to the government for unemployment insurance, 1 per cent for the start on contributory old age benefits and employes 1 per cent as their share of the latter.

In 1938 the total payroll payment to the government would be 5 per cent, broken down into 3 per cent for unemployment insurance and 1 per cent each by employers and employes for old age pensions.

Steel Rate Crosses 50% as Youngstown And Chicago Districts Rise Sharply

STEELMAKING crossed 50 per cent last week, going to 51, a gain of three points. This was the highest level since the third week in February and was more than double the rate in the comparable week of 1934.

Steelmaking Operations

Percentage of Open-Hearth Ingot Capacity Engaged in 10 Leading Districts

	Week ended Aug. 17	Change	Same week 1934	Same week 1933
Pittsburgh	42	+ 1	15	46
Chicago	57	+ 4	28	48
Eastern Pa.	32½	+ 1	20½	40½
Youngstown	57	+ 6	22	60
Wheeling	84	+ 5	26	80
Cleveland	59	— 3	13	77
Buffalo	34	— 3	23½	53
Birmingham	35½	None	25	55
New England	56	+11	29	83
Detroit	94	+ 6	77	55
Average	51	+ 3	21½	51

This rise was due to heavier schedules in the Pittsburgh, Chicago, eastern Pennsylvania, Youngstown, Wheeling, New England and Detroit districts. No letdown is anticipated before the Labor Day holiday, after which operations are again expected to swing upward. Details for various districts follow:

Chicago—Expanded 3 points at the opening of last week and gained an additional 2 points during the week to 58 per cent. This is the best rate in more than six months and the highest for the comparable week since 1929. Expectations of a recession this month are less marked and fairly steady schedules are in prospect for the next several weeks. Blast furnace operations are unchanged, with 13 steelworks stacks out of 36 active. Two merchant furnaces also are in blast.

Youngstown—Jumped 6 points to 57 per cent as an average, and concluded the week at 60 per cent. A 62 per cent rate is indicated for this week's start on a steadily mounting volume of orders. Republic Steel Corp. put on three more open-hearth furnaces, one at Warren and two at Youngstown, while the Youngstown Sheet & Tube Co. late last week relighted three open hearths at the Brier Hill works.

Pittsburgh—Up 1 point to 42 per cent last week, as the operations of a leading interest improved to 35-37 per cent. Individual rates of other producers remain generally unchanged.

Twenty-three steelworks blast furnaces are on active schedule, a gain of one. Carnegie Steel Co. has blown in a second Isabella furnace on ferromanganese, making 9 of 32 on. Jones & Laughlin Steel Corp has 7 of 11 stacks on blast and American Steel & Wire Co., National Tube Co., Pittsburgh Crucible Steel Co., each one. Bethlehem Steel Co. has 3 of 7 on at Cambria works, Johnstown, Pa.

Central eastern seaboard—Rose 1 point to 32 to 33 per cent, with the possibility of a further increase. Operations appear to be materially assisted by tonnage originating outside the immediate district. For instance steel for plates is being produced at the highest rate this year, although local sales over the past fortnight appear to have fallen off. A certain amount of ingot production is undoubtedly for stock, producers expecting substantial improvement after Labor day.

Alan Wood Steel Co. has resumed operations at its Scrub Oak mines near Dover, N. J., producing 1000 tons of concentrates daily.

Detroit—Gained 6 points last week, one producer resuming with another unit to operate all eight, while another interest was melting in eight.

Buffalo—Off 3 points to 34 per cent, with 13 open hearths on the active list, a decline of 1. Producers are expected to continue in operation up until the Labor Day holiday, with increases anticipated after that time.

Cleveland-Lorain—Down 3 points to 89 per cent, National Tube Co., Lorain, taking off one open hearth to operate 8, Corrigan, McKinney Steel Co. continuing with 11 and Otis Steel Co. with 4.

Wheeling—Up 5 points to 84 per cent last week. Thirty-one out of 37 open-hearth furnaces are on active schedule, against 29 a week ago.

New England—Advanced 11 points to 56 per cent last week. Operations will rise to approximately 66 per cent starting this week due to addition of an open hearth.

Birmingham—Steady demand for steel maintained steelmaking at the 35½ per cent level. Eight furnaces are on active schedule.

U. S. STEEL CORP. SHIPMENTS

(Inter-company shipments not included)
(Tons)

	1935	1934	1933	1932
Jan.	534,055	331,777	285,138	426,271
Feb.	583,137	385,500	275,929	413,001
March	668,056	588,209	256,793	388,579
April	591,728	643,009	335,321	395,091
May	598,915	745,063	455,302	338,202
June	578,108	985,337	603,937	324,746
July	547,794	369,938	701,322	272,448
7 Mo.	4,101,793	4,048,833	2,913,742	2,558,338
Aug.		378,023	668,155	291,688
Sept.		370,306	575,161	316,019
Oct.		343,962	572,897	310,007
Nov.		366,119	430,358	275,594
Dec.		418,630	600,639	227,576
Yrl. adj.		19,907	44,283	5,160
Total		5,905,966	5,805,235	3,974,062

STEEL SHIPMENTS DOWN SLIGHTLY IN JULY

Shipments of finished steel by the United States Steel Corp. in July, at 547,794 tons, showed a decline of 30,314 tons from the 578,108 tons shipped in June. The drop from June to July in 1934 was 615,399 tons and in 1933 July shipments were 97,385 tons larger than in June. Shipments for seven months of 1935 totaled 4,101,793 tons, compared with 4,048,833 tons in the corresponding period of 1934.

Wean Acquires License

License agreement has been concluded by the Pittsburgh Research Corp., Pittsburgh, whereby the Wean

Engineering Corp., Warren, O., has the exclusive license to make, use and sell in connection with fuel-fired furnaces under the Moore-Simpson patent No. 1892112 covering the use of containers or inner covers in connection with bell type furnaces. License to users will be through the sale of equipment by the Wean Engineering Corp.

Merger

REPUBLIC STEEL CORP. has called a special stockholders meeting for Sept. 16 at Jersey City, N. J., at which time it is expected that all necessary steps to carry out the merger with the Corrigan, McKinney Steel Co. and to effect the plan for recapitalization will have been completed.

An amended registration statement is being filed with the securities and exchange commission, Washington. The merger, initiated last August, is finally being consummated as the government, after losing its suit to prevent it, has decided not to appeal. (STEEL, Aug. 5, p. 15.)

An alignment of the Truscon Steel Co., Youngstown, O., with the enlarged Republic Steel Corp. will follow the definite merger of Corrigan, McKinney with Republic.

RYERSON MEETS AUG. 30 ON MERGER WITH INLAND STEEL

Stockholders of Joseph T. Ryerson & Son Inc., Chicago, will meet Aug. 30 to vote on the proposed affiliation with Inland Steel Co. (STEEL, Aug. 12, p. 14.) This merger also will require a reorganization of the Ryerson company, since it is incorporated in Illinois and laws of that state do not enable a direct merger with a foreign corporation. Since the Inland company is incorporated in Delaware, it will be necessary to reorganize the Illinois corporation of the Ryerson company, turning the assets over to the Delaware corporation.

Plaque for Prize Bridge Dedicated at Bourne

A stainless steel plaque, awarded by the American Institute of Steel Construction, New York, was affixed Aug. 15 to the highway bridge across the Cape Cod canal at Bourne, Mass., designating it the most beautiful monumental steel bridge built in 1934. The plaque was presented by Charles N. Fitts of the New England Structural Co., a director of the Institute, and was received by Col. John J. Kingman, of the Engineers Corp., representing the owners. The bridge was designed by Fay, Spofford & Thorndike, and was fabricated by the American Bridge Co.

National Profits from Scrap Use, Flat-Rolled Products

THE steel industry's outstanding profit performer—National Steel Corp.—can attribute its remarkable depression earnings, while most of the remainder of the steel industry was mired deep in the red, to a number of natural and fortunate factors.

As STEEL reported (Aug. 5, p. 14), National Steel netted $6,558,802 in the first half of 1935. Substantial profits also were shown by Inland, Republic, and American Rolling Mill over the same half year, yet proportionately, National's record outdistanced the field.

To answer the recurring query as to how National does it, STEEL attempts to analyze this producer's setup.

Since the time National Steel was formed, in 1930, its earnings may be traced to a combination of two extremely potent facts: It has not only enjoyed low costs, but it has also enjoyed a heavy demand consistently for the particular type of products in which its capacity is concentrated.

To analyze the cost angle first: The company's Weirton, W. Va., plant is located on the Ohio river, some 50-odd miles below Pittsburgh. It is in close proximity to coal and limestone, both of which can be barged cheaply into Weirton.

This plant lists an annual ingot capacity of 1,312,000 tons of steel ingots, made in 12 open-hearth furnaces. But to make the steel ingots the company has a rated pig iron capacity of only 631,800 tons, less than one ton of pig for each ton of steel.

At this point scrap enters the cost picture, for Weirton is a heavy user of scrap for remelting purposes and consistently over the last five years has found that good remelting scrap delivered at the Weirton open hearths is obtainable at a measurable saving over the cost to make pig iron. Scrap prices in the last few years have ranged up to $8 a ton less than pig iron.

Furthermore, the company with but two blast furnaces at Weirton works has had at no time little idle capacity accumulating charges, it has had a smaller capital investment in blast furnaces than other steel producers, and has been able to capitalize on a low-priced scrap market consistently at a time when other steel producers were disinterested in buying scrap and were trying to operate high-cost blast furnaces for their open-hearth requirements, and, in a measure, attempting to reduce their own overhead.

Such is one important cost saving. On finished products at Weirton, the adjoining river offers cheap transportation to destinations southward, obviating higher-cost rail rates. Thus, assuming actual steelmaking costs are the same at Weirton as an average for the industry, it can be seen that the saving in raw materials, both as to actual cost plus what it takes to transport them to Weirton, are substantial enough in themselves to mount up to a significant item.

Same Story at Great Lakes

The company's other important division—Great Lakes Steel Corp. at Detroit—likewise has an interesting costs' story. This mill has capacity to make 950,000 tons of steel ingots in eight open-hearths. Again, as at Weirton, adjoining blast furnace capacity (two furnaces) is not sufficient to compensate, for rated pig iron capacity at this division is 360,200 tons, roughly one-third the steel ingot potentialities.

Again, the Great Lakes division utilizes scrap to a large extent and profits from the low-cost Detroit and Michigan market, finding an appreciable saving from the cost of iron. Furthermore, on what pig iron it does produce, National, insofar as the Great Lakes Steel division is concerned, has a large freight saving in that iron ore brought down from the Lake Superior district ranges and arriving at final destination in Detroit precludes the rail haul inland which Youngstown and Pittsburgh mills must pay.

Now to analyze the other side of

(*Please turn to Page* 84)

Weir Sees Good Quarter

IMPROVEMENT in steel buying started much earlier than usual this year," stated Ernest T. Weir, chairman of National Steel Corp., sailing for Bermuda recently. "It came sooner than most authorities anticipated. As a result, the third-quarter showing thus far has been very encouraging. July was a good month and the prospects for August also are favorable for good operations and earnings."

WINDOWS OF WASHINGTON

WASHINGTON

SOME Brain Truster at NRA apparently is trying to cause the steel industry as much annoyance as possible.

It will be recalled that NRA made an intensive study of the steel basing point question a short time ago; NRA is now carrying on a steel "study" which takes up the question of the basing point, among the many other problems; and now on top of that comes an entirely independent investigation of basing points by another branch of NRA—the geographic price structure unit of the trade practice study section. The studies have nothing at all to do with one another.

And while on this subject of the industry studies being made at NRA, letters were sent out to 2400 trade associations asking their co-operation in these studies. Answers have practically stopped coming in now, and to date only 50 answers have been received out of the 2400 inquiries sent out.

Teacher Directs Survey

It is reported that Malcolm Sharp, a protege of Felix Frankfurter, is taking a prominent part in the NRA steel survey now under way. R. W. Shannon, in charge of this work, reports that it is going along about as expected.

It was no other than Mr. Sharp, according to NRA reports, who prepared the original outline for the new steel study, which was declared by several officials of NRA to be quite radical. It is stated, however, at the offices of the former Blue Eagle that this outline has been considerably modified since it was first drawn up.

Mr. Sharp was one of those called on to help on the steel basing point report which NRA made some months ago. He was graduated from Amherst in 1918, later teaching economics under Prof. John R. Cummings at the University of Wisconsin. The latter, incidentally, also did some work on the steel basing point study. Mr. Sharp was also a research fellow at Harvard Law School, studying under Professor Frankfurter. He was engaged to teach at the University of Chicago in the fall of 1933. He is now working with NRA on the steel study.

GUFFEY AND WALSH BILLS NOT LIKELY TO HOLD CONGRESS

Opinion differs greatly, as this is written, as to just when congress will adjourn, although Majority Leader Robinson said in the senate Friday he looks for it this week.

There are two bills of particular interest to the steel industry that are being pushed for passage before adjournment by the administration, but final action is in the balance.

They are the Guffey coal bill, reported out of the house ways and means committee, and the Walsh bill putting NRA hour and wage conditions in contracts for government supplies.

The Walsh bill has passed the senate after much wrangling, and Representative Connery is trying to get a special rule to rush this bill through the house. The President is anxious to get action on both of these bills, but they are not considered "must". In other words, he would not hold congress here just to get action on these two bills.

A favorable report was made last week on the Guffey coal bill by a 12 to 11 vote by the ways and means committee of the house only after a deadlock in committee lasting for weeks. This bill, it will be recalled, sets up a miniature NRA to govern the soft coal industry.

It is through this bill that the President hopes, it is reported, to test the flexibility of the constitution and it is the last measure on the proposals of the White House for action at this session on which the house has not acted up to this time.

The favorable report on this measure was only obtained after two Democratic members of the committee, who are unalterably opposed to this measure, had changed their vote from "no" to "present"—to allow the bill to be reported out.

It is anticipated that this bill will run into some trouble in the senate and for this reason it is quite possible that it will be abandoned rather than keep congress here any longer than is necessary.

Regarding the Walsh government contract bill, it is believed that this bill will be rushed through the house without the formality of hearings. Effort was made to do this in the senate some weeks ago but so many protests were made that the bill had to be recommitted to the committee in charge for the holding of hearings. However, time is so short now until adjournment that it is believed that no house hearings will be held.

APPOINTMENTS TO NRA AND NEW LABOR BOARD DRAG

The President has not yet appointed an administrator to head NRA as successor to James L. O'Neill, nor has he appointed members of the new national labor board.

It has been more than a month since the labor board bill passed, after having been rushed through congress at top speed, and still the President is withholding appointments to this board.

At NRA there is no head. There is said to be a neck-and-neck race for administrator between Prentiss L. Coonley, recommended by Mr. O'Neill to the President before he left, and George L. Berry, laborite.

Mr. Berry's friends claim that he is a close personal friend of the President. On the other hand, it is reported on good authority that if Mr. Berry is appointed head of NRA such co-operation as is being given by industry on the so-called "surveys" being made will be withdrawn.

Mr. Berry is an A. F. of L. man

and industrialists feel that if he should head up this work these "studies" may lead either to "investigations" or even "prosecutions" of industry, and labor will be able to get information through questionnaires and in other ways, which it has been hunting for for many years.

Repeated questions have been put to the President at recent press conferences regarding the filling of these vacancies, and he always states that he hopes to be able to announce the appointments soon. That has been going on for weeks.

COURT ACTION ON TRADE AGREEMENTS IS THREATENED

Considerable interest in the constitutionality of the trade agreement act has been evidenced in legislative and governmental circles recently by the threat of Texas and other state farmers to the effect that if the AAA is declared unconstitutional, they will take the trade agreement into the courts.

"The trade agreements act is a commendable beginning," William S. Culbertson said recently in a talk. This shows the attitude of one side of the question. Mr. Culbertson is a Republican, former chairman of the United States tariff commission, and long time student of the tariffs of our government.

"The trade agreements," he continued, "should, perhaps in a strengthened form, be made a permanent part of our administrative law by a repeal of the three year limitation. The unconditional form of the most favored nation clause should replace the general and conditional clauses wherever they exist in our treaty structure.

"Both legally and economically," he continued, "its place in our commercial policy should be emphasized. Finally, under the President's plenary powers over foreign nations, instrumentalities, ranging from penalty duties to international conferences, should be used during the next decade to establish sane commercial policies among the nations."

RAIL, BEARING EQUIPMENT SOUGHT HERE BY SOVIETS

It is reported at the department of commerce that during the past two months the Soviet government has purchased some $5,000,000 worth of machinery in the United States.

The Soviet government is understood to be interested in acquiring some of the latest types of railroad manufacturing and maintenance equipment. The Soviets also are planning on the establishment of another large bearing factory, and they are said to be disposed to buy the proposed equipment to manufacture all types of antifriction bearings in the United States.

Preliminary investigations regarding the latest technique available in the industry are now reported to be under way. Recently, representatives of the Soviet government have been in Wasnington conferring with officials of the department of commerce.

Meetings

DROP FORGING association, 605 Hanna building, Cleveland, is arranging group meetings as follows: Aug. 12 at Chicago, Palmer House; Aug. 13, at Detroit, Hotel Statler; Aug. 14 at Cleveland, Chamber of Commerce; Aug. 15 at Buffalo, Hotel Statler; Aug. 16 at Hartford, Conn., Hotel Bond. All meetings will be attended by A. J. Sanford, president; B. M. Seabury, secretary-treasurer; and a member of the board of directors representing the local district.

PHILADELPHIA DELEGATION TO SHOW TO LIVE ON TRAIN

Philadelphia Machinery Distributors, 1458 Broad Street Station building, Philadelphia, has arranged with the Pennsylvania railroad for a special train to Cleveland for the machine tool exhibition Sept. 11-21. The train will leave Philadelphia Sept. 16, be parked in Cleveland near the public auditorium to serve as hotel quarters, and will return to Philadelphia leaving Cleveland the night of Sept. 19.

SPECIAL TOOL, DIE & MACHINE SHOP MEETING SEPT. 14-16

Special Tool, Die & Machine Shop institute, Guarantee Title building, Cleveland, will hold its anual meeting and convention in Cleveland, Sept. 14-16, coincident with the machine tool show. Headquarters will be at Hotel Statler. All who operate jobbing shops in the tool, die and special machinery divisions are invited to register all day Sept. 14 and the morning of Sept. 15 and also attend the sessions on those days. Trustees of the Institute July 17 adopted plans looking to the advancement of the industry by the adoption of sound business policies and promotion of greater co-operation among members. George J. Huebner is secretary of the Institute.

Financial

IN ITS customary quarterly explanation of its financial and operating situation to employes, the Ludlum Steel Co., Watervliet and Dunkirk, N. Y., in a recent issue of *The Ludlum News* states:

"As for the future, we feel that business is ready and willing to go and that soon industry must receive some assurance that it will not be further harassed by drastic taxation or experimental legislation. In spite of present governmental confusion and uncertainty and the pressing greed of the tax-gatherer, we are optimistic; we are spending money to get our mills in shape to take advantage of any improvement that comes; because at Ludlum men and management are co-operating."

Ludlum has declared the regular quarterly dividend of $1.62½ on its preferred payable Oct. 1 to record of Sept. 23.

New Capacity

WEST LEECHBURG STEEL CO., Pittsburgh, has placed an order with United Engineering & Foundry Co., Pittsburgh, for a new one-stand four high cold strip mill, having a monthly capacity of 3000 to 4000 tons, beginning Nov. 1. The contract, including electrical work incidental to it, is valued at approximately $300,000.

The new mill will be capable of rolling all gages up to 28 inches wide. It will be Timken-bearing equipped. The electrical subcontract has been placed with Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

The mill will be equipped with automatic gagers and all other modern equipment, and will be installed at Leechburg, Pa., in an existing mill building. Although it will be able to roll to a greater range than an existing 4-stand, 2-high cold mill that up until recently was steam-driven, the latter mill will be torn down to make room for the new 4-high.

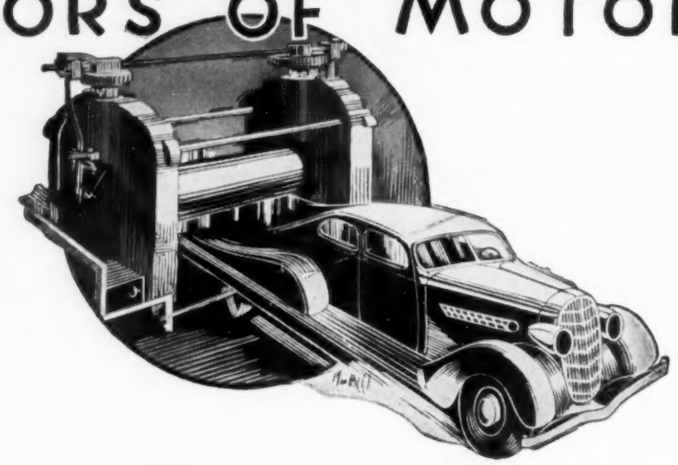
CARNEGIE PLATE MILL WILL COVER AREA OF 9½ ACRES

Carnegie Steel Co.'s new plate mill, to be erected at Homestead, Pa., will be a 100-inch semicontinuous, electric-driven, sheared plate mill located between the present 110-inch (Liberty mill) and the Pittsburgh & Lake Erie tracks, West Homestead, Pa., covering an area of 1800 by approximately 300 feet over all, with a floor area under roof of 404,210 square feet (approximately 9½ acres).

The mill will consist of the following: Four continuous-type reheating furnaces; one 36-inch x 100-inch two high, non-reversing scale stand; one 42-inch and 52-inch x 120-inch, four high, spreading stand; one slab squeezer; one 36-inch and 54 x 100-inch, four-high, reversing roughing stand with vertical edging stand; four 27-inch and 54 x 100-inch, four-high, continuous finish stands with shears and normalizing equipment.

The average slab used by the new Carnegie mill will be 54 x 6 x 90 inches and the finished product will measure 20 inches to 90 inches, inclusive in width, by 3/32-inch to ¾-inch, inclusive in gage. The product will range from standard carbon steel to high tensile steels, such as United States Steel Corp. "Cor-Ten," "Man-Ten," and "Sil-Ten." Rated capacity of the mill is 728,900 gross tons per year.

MIRRORS OF MOTORDOM



DETROIT

A DECADE and a half ago the automobile industry, just coming into its maturity, led the country out of the depression of 1920. Now it begins to look as if the industry, including its requirements for machinery and equipment as well as for materials, again were the bellwether of recovery.

The buoyancy being manifested in many industries, including steel, and in the stock market appears to Detroit to be a belated recognition of the strong situation that has characterized automobiles since February.

The lowest month so far in 1935 has exceeded by a wide margin the best month of 1933. Beginning with March this year, each month has topped the highest month of 1934. Last week the total output of passenger cars and trucks, for the United States only, passed the total for all 1934, and 1935 will exceed 1934 by the number of units assembled in the remainder of the year.

One Fourth of Steel Output

Take, for example, the lift the automobile industry has supplied to steel. For many years the industry's takings of steel have hovered around the 20 per cent mark. Last year, when the proportion was 20.87 per cent, the automobile manufacturers' indicated consumption of finished rolled steel was 3,958,936 tons, or 1.437 tons per car.

Applying this average use of steel per car to the production in the first seven months, and relating this to the tonnage of steel produced, the ratio for the automobile industry figures out to 28 per cent. Inasmuch as 60 per cent of the year's output of automobiles normally is accounted for in the first half, doubtless the proportion will not be so high in the last five months as the first seven. But it should not fall a great deal under 28.

Last week's assemblies—56,386 cars and trucks—pretty well represents the industry in the trough preceding the changeover. Ford resumed last Monday on 1935 models; some other manufacturers went down. Probably the area between the middle of August and the middle of September will include the low point.

As befits an alert industry, automobile executives account the good showing thus far this year as so much water under the dam. What matters is the market over the remainder of the year. The rural market unquestionably is the focal point. Good crop income, and there are estimates of its being several billions greater than last year, will create a market for the new models that will neutralize the lack of buying of labor in the railroad, building and a few other dragging industries.

Certainly the rural areas where the AAA has spent money with a lavish hand this year have turned in the greatest percentage increases in the registration of new cars in the first half of 1935 compared with the first half of 1934.

In South Dakota the increase over last year has been 105 per cent, in Montana 104, in Indiana an even 100 and in Wisconsin 91. Idaho is in the higher brackets with a gain of 84 per cent, and also Oregon with 82.

Five Other States Rank High

Illinois, which is a hybrid of both industry and agriculture, bought 78 per cent more autos than in the first half of last year. Other high states are California 75, Utah 72, Kansas and Tennessee both 71. So it is evident that the greatest revival of new car buying this year has been in the agrarian areas.

Incidentally, new car registrations in the first half for the country as a whole were 1,400,000, against 995,000 a year ago.

Chrysler, which last week assembled 9750 units ,compared with 13,900 the week previous, continues to distribute parts business on a large scale for its 1936 series. The Globe Machine & Stamping Co., Cleveland, has received a substantial order for radiator grilles, which will be stamped from strip steel, for Plymouth, Chrysler and Dodge—and also for Studebaker.

Ford, resuming from its vacation, assembled 20,000 units last week. It has completed modernization of its two blast furnaces at the Rouge plant, each having a daily capacity of 800 tons of pig iron compared with 500 and 600 tons, respectively, previously. A total of $580,000 was spent on the blast furnaces.

Ford also has broken ground at Northville, Mich., for a new valve plant, another unit in the group of "village" industries Ford has developed. At Chicago, the Oakes Products Corp. is expected to be a substantial buyer of stainless steel for the big 13-inch hub cap for 1936 Fords.

Completing Ford Mill

Ford announced last week that the $10,000,000 continuous strip-sheet mill project at the Rouge plant is reaching its final stage. No date has yet been set for turning over the hot mill. Bethlehem, incidentally, expects to bring in its new continuous mill at Buffalo early in December.

Studebaker, which was closed for a week, has resumed, practically regaining its former rate of 900 passenger cars and 100 trucks weekly. Studebaker's export business in July was 31 per cent greater than last July and the best for that month since 1928.

Willys-Overland, spurred by court permission to manufacture 10,000 passenger cars, is actively preparing for an early start on assemblies, possibly next week, in order to have cars in the hands of dealers by Labor day.

Pontiac continues closed. Indicative of the comparatively slight revision in prospect on this General Motors line, it is said there are only seven bolt changes. Viewed from the side, Pontiac's radiator and hood bead will go back at an angle of al-

most 90 degrees. It is retaining the chrome-plated windshield division.

"Cor-Ten" steel, the high-tensile, light-weight steel that was developed by subsidiary companies of the United States Steel Corp., primarily as a steel for lightening the dead weight in railroad cars, is being experimented with by the automotive field.

One large Detroit body builder recently took in six tons of Cor-Ten in sheet form and proceeded to run tests. The steel holds lacquer well and of course with a marked impact value, may be used extensively in fenders before long.

Little difficulty was found in Cor-Ten's drawing qualities for fenders. For some little time this type of light-weight steel has been used by several motor makers for frames. It has been used in sheet and strip form, bent and fabricated, rather than in rolled shape.

Advocates of rotary valves in place of poppet valve action charge the latter with being the worst offender from the standpoint of noise in automobile power plants. Next come piston noises. . . . Aluminum cylinder heads are being made a little heavier, the tendency to skimp to save weight being overcome by studies leading to better sectioning of the heads. . . . Some 1936 models are going to reduce the width of running boards materially and incorporate the space inside bodies. . . Electric Auto-Lite Co., Toledo, O., is broadening its range by acquiring the Central Brass & Fixture Co., Springfield, O., where bumpers will be made, and the Alemite Die-Casting & Mfg. Co., Woodstock, Ill.

Labor

REPORTS percolated through to Pittsburgh last week that the executive council of the American Federation of Labor meeting at Atlantic City, N. J., would soon ask the Amalgamated Association of Iron, Steel and Tin Workers at Pittsburgh to launch a membership drive.

The reports took the Amalgamated by surprise, and Secretary Louis Leonard had to wire William Green, A. F. of L. president, for details. Internal dissension has reaped its toll in the Amalgamated's ranks the last year, for what with rank-and-filers like William Spang, court test cases for the reinstatement of ousted lodges, and attempts to collect delinquent dues, the Amalgamated has had its hands full and consequently has not pursued new members. Through last week, too, President Tighe was confined to a hospital.

VACATIONS, WITH PAY, AT YORK

W. S. Shipley, president, York Ice Machinery Corp., York, Pa., has notified all salaried employes that they will receive full salary during the full two-week vacation period this year. This is in addition to a recent 6 per cent increase in salaries.

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1933	1934	1935
Jan.	128,825	155,666	292,817
Feb.	105,447	230,256	335,700
Mar.	115.272	338,434	429,834
Apr.	176,432	352,975	477,746
May	214,411	330,455	364,727
June	249,727	306,477	361,320
July	229,357	264,933	*340,000
7 Mo.	1,219,471	1,979,196	*2,602,144
Aug.	232,855	234,811	.....
Sept.	191,800	170,007	.....
Oct.	134,683	131,991	.....
Nov.	60,683	83,482	.....
Dec.	80,565	153,624	.....
Year	1,920,057	2,753,111	.....

*Estimated.

Estimated by *Cram's Reports*

Week ended:

Aug. 3	69,415
Aug. 10	48,067
Aug. 17	56,386

GOOD JULY IN METALWORKING

Metalworking employment at 22 leading centers increased 1.5 per cent during July to the best rate for that month since 1930, according to the National Metal Trades association. The July index of 69.7 compares with 68.7 in June, 68.4 a year ago, 54.9 two years ago, and 49.6 three years ago. Most centers reported increased employment, the gain being curtailed by a sharp decrease at automotive points.

Paul J. Kalman

Died:

PAUL J. KALMAN, 56, chairman of the board of Bliss & Laughlin Inc., Buffalo, and Globe Steel Tubes Co., Milwaukee, at White Bear lake, Minn., Aug. 8. In 1901 he entered the railroad supply business under the name of Paul J. Kalman Co. Later he went into the steel and building material business, in this venture heading the Kalman Steel Co. which in 1931 became subsidiary of Bethlehem Steel Co. In 1920 he reorganized Bliss & Laughlin, with mills in Harvey, Ill., and Buffalo; two years later he reorganized Globe Steel Tubes. He was a director of two St. Paul banks and a partner in a New York financial house.

♦ ♦ ♦

D. L. Jones, 58, formerly a plant manager for the American Can Co. at Chicago, in that city, Aug. 12.

♦ ♦ ♦

W. L. Jefferies Jr., sales representative for the Union Spring & Mfg. Co., New Kensington, Pa., in Richmond, Va., Aug. 8.

♦ ♦ ♦

George M. Keefer, 58, Pittsburgh district sales manager for the Rensselaer Valve Co. for over 30 years, in Scranton, Pa., Aug. 13.

♦ ♦ ♦

Elias M. Johnson, 84, at one time president of Isaac G. Johnson & Co., iron and steel interest, the Bronx, New York, in South Poland, Me., Aug. 13.

♦ ♦ ♦

L. W. Robinson, 79, nationally known coal and iron operator and identified during the past 50 years with development of the mining industry, in Rochester, N. Y., Aug. 15.

♦ ♦ ♦

Capt. O. R. Barrett, president of the Barrett Line Inc. and the Barrett Lime Quarries Inc., both of Cincinnati, in that city, Aug. 12. He was also prominent for a number of years in the development of the Ohio Valley Improvement association.

♦ ♦ ♦

Thomas J. Muir, 58, director of sales of the Morgan Engineering Co., Alliance, O., in that city, Aug. 6. He entered the employ of the company in 1902 and became associated with the sales department in 1907. In 1927 he was named assistant sales manager, and in 1931 director of sales.

♦ ♦ ♦

Paul A. Ivy, 55, vice president in charge of sales for National Cast Iron Pipe Co., Birmingham, Ala., in an airplane accident near Gilmer, Tex., Aug. 15. He had been to Mexico City on a business trip and was on his way home when the accident occurred. He was general sales manager of the American Cast Iron Pipe Co. prior to going with National five years ago.

Industrial Men in the Day's News

Harry W. McQuaid, Campbell Lecturer, National Metal Congress

An experienced metallurgist, he is co-originator of the well-known McQuaid-Ehn grain size test.

He has devoted much time to the study of steelmaking practice and properties of steel after processing.

Over the past 20 years he has contributed extensively to the technology of steel treatment.

HARRY W. McQUAID, metallurgist, Republic Steel Corp., has accepted the invitation to present the Edward De Mille Campbell lecture at the annual meeting of the American Society for Metals, in connection with the National Metal congress in Chicago, Sept. 30-Oct 4. The lecture will be given Oct. 2 (see p. 26).

Since its establishment in 1926, the Campbell lecture has become a major event of the technical programs of the congress. Mr. McQuaid, co-originator of the McQuaid-Ehn grain size test, has specialized in the study of the relation between steelmaking practice and the properties of steel after processing. He is nationally known as a specialist in steel for gears and case hardened parts.

He first noted the connection between hardenability and steelmaking practice in 1919 and developed the carburizing test later known as the McQuaid-Ehn test. He has written and presented numerous technical articles before the various technical societies.

His first position was with the United Piece Dye Works, Lodi, N. J., in the engineering department. In 1914, he became connected with the Selas Co., Canton, O., and in 1915 joined the staff of the Timken Roller Bearing Co. In 1922 he became manager of the Precision Gear Blank Co., but in 1924 returned to Timken as metallurgist.

Two years later he was transferred to the Timken-Detroit Axle Co., Detroit, and in 1933 went to Republic.

♦ ♦ ♦

H. R. Slater, formerly general manager of sales of the Cohoes Rolling Mill Co., Cohoes, N. Y., has been appointed general manager, succeeding A. Macfadyen who has been named general manager of Page-Hersey Tube Ltd., Toronto, Ont.

♦ ♦ ♦

Frank L. Gibbons, director of sales for Timken Steel & Tube Co., Canton, O., since 1932, has been elected vice president in charge of sales. He is widely known in the alloy steel industry, former associations including Crucible Steel Co., Central Steel Co., Central Alloy Co., and Republic Steel Corp. He first became active in steel sales in 1908.

♦ ♦ ♦

W. A. Meddick has been appointed to the sales department of C. O. Bartlet & Snow Co., Cleveland, to take charge of the company's sales of mixers, air filters and accessory lines. Formerly he was manager of the industrial department of the Lakewood Engineering Co., and later district representative for a group of manufacturers.

B. J. Schneider, 909 Roosevelt building, Indianapolis, Ind., has been appointed district representative for Bartlett & Snow. He was formerly with Combustion Engineering Corp.

♦ ♦ ♦

John P. Hilands, long associated with the seamless tube industry, first with the Shelby Steel Tube Co., later with the Ohio Seamless Tube Co. and more recently with Peter A. Frasse & Co., New York, as manager of stainless and alloy steel sales, is now with Tube Reducing Corp., Stamford, Conn., in charge of general sales and advertising, having assumed his new duties Aug. 1.

♦ ♦ ♦

R. E. W. Harrison, chief, machinery division, department of commerce, has resigned, effective Sept. 30, to resume consultant practice to the metal working industries.

Mr. Harrison will be associated with Eugene C. Clarke, with offices at 1818 Packard building, Philadelphia. He will act as technical consultant for such concerns as the Chambersburg Engineering Co., manufacturer of metalworking and forging equipment, and the Cochrane Corp., in the development of their line of steam specialties. The scope of his new activity will cover the entire range of management.

Mr. Harrison was appointed chief of the machinery division, bureau of foreign and domestic commerce, in April, 1934. Since then he has been constantly engaged in aiding the industry toward recovery. He is a nationally recognized authority on questions pertaining to the machinery industry.

R. E. W. Harrison

♦ ♦ ♦

Arthur G. White, general manager of sheet and tin plate mills of Follansbee Bros. Co., Pittsburgh, has resigned. At one time connected with American Sheet & Tin Plate Co. and Trumbull Steel Co., he was associated later with Otis Steel Co., and then went with Follansbee, being named vice president in charge of production in 1933.

Victor Marlier tentatively has succeeded Mr. White.

EDITORIAL

Main Street Is Cleaning Up After Federal Labor Orgy

REPORTS from some strike-troubled industrial centers indicate that the labor relations situation is beginning to show signs of improvement. As would be expected by those who know the labor problem from hard earned experience, the improvement is being brought about largely through the efforts of local authorities.

Here and there mediators furnished by the federal government have brought disputants together and have succeeded in patching up agreements satisfactory to both sides. Such cases usually are given headline publicity in the newspapers. As a matter of fact, a few of the government mediators are excellent judges of human nature, are adept at reconciliation and richly deserve credit for their efforts to bring peace to trouble-ridden industrial communities.

But for every dramatically publicized settlement effected by agents of the federal government, there are scores of disputes which are settled locally and without blare of trumpets. Moreover, the cases handled by local authorities more often than not are solved by removing the deep-rooted evils which caused the trouble, whereas the disputes tackled by government agents often are smoothed over by a truce—sometimes based on superficial compromise—which may or may not endure.

Local Politicians and Union Labor Leaders Subject Community to Reign of Terror

Consider the situation in a midwestern industrial city. At the time the new deal administration assumed office, this community was plagued by many labor unions—A. F. of L. and otherwise—which were ruled by incompetent, lawless, local officers. The political situation, which was bad enough, became worse. Cheap politicians and labor union racketeers, appeared to be in an alliance which subjected the city to almost unbelievable acts of lawlessness.

Naturally, the labor relations policies of the new deal helped these unprincipled local officials to pursue their nefarious activities with more effectiveness than ever before. Every high-sounding phrase uttered by President Roosevelt or other new dealers was taken up by the racketeer labor and political leaders and distorted to serve their purpose of extracting more tribute from the unfortunate union members and of making more trouble for employers.

Heads of unions affiliated with A. F. of L. openly defied the local courts. Police brazenly helped pickets to halt plant operations. Window smashing, stench bomb throwing, black-jack slugging, and even the use of explosive bombs became common, every-day occurrences. Most of these activities were carried on under the avowed stimulation and inspiration of new deal labor policies. Moreover, while good citizens and honest, sincere, local labor officials protested violently against these outrages, the high officials of A. F. of L. and the labor policy executives of the federal government in Washington apparently took no cognizance of the situation until it had become so bad that it was a national scandal. The secretary of labor, advised of the prevalence of strikes in this community, dismissed it airily with the remark that the excessive number of labor disputes was but a sign of returning prosperity!

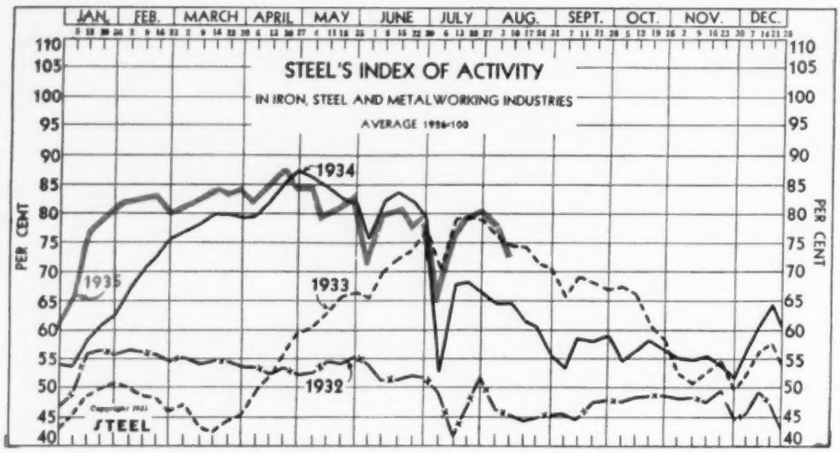
Public Opinion, Fired by Courage of Judge, Forces Local Labor Leaders To Clean House

But locally the people were beginning to realize that the situation no longer could be tolerated. They resented dictation by ex-convict laborites. They were provoked by the apparent reluctance of the government or of A. F. of L. national leaders to curb the unruly element. Thus, when a local judge risked political extinction by insisting that his injunctions be complied with—in spite of police indifference and of labor union arrogance—public opinion turned against the malefactors of new deal power. Conscientious labor union leaders saw the handwriting on the wall. They saw the doom of the union labor movement unless they cleaned house. With little or no help from the national A. F. of L. officials, they elected a new set of local officers—officers who are pledged to obey the law, to oust the lawless element from their rosters, to respect the rights of citizens and to make an honest effort to give the union members something tangible in service in return for their dues.

The rotten political machine which assisted the lawless labor element probably will be kicked out in the next election. In brief, the reign of terror apparently has run its course. Sanity seems to have returned to the public, and with it a feeling of repulsion against the labor policy blunders of the new deal.

This community has learned from brutal experience the price one pays for national brain trust demagoguery, when it plays blindly into the hands of local racketeers.

THE BUSINESS TREND



STEEL'S *index of activity in the iron, steel and metalworking industries declined 5.1 points to 73.3 in the week ending August 10:*

Week ending	1935	1934	1933	1932
June 1	71.9	75.7	65.3	51.0
June 8	79.3	82.3	69.9	51.1
June 15	80.0	83.6	72.1	51.8
June 22	77.3	81.8	73.9	51.6
June 29	78.4	79.4	77.0	49.2
July 6	64.1	52.3	71.4	41.7
July 13	76.5	67.8	79.1	46.7
July 20	79.8	68.1	79.4	51.5
July 27	80.8	66.4	78.8	46.1
Aug. 3	78.4†	64.6	75.9	45.1
Aug. 10	73.3*	64.6	74.7	44.6

†Revised. *Preliminary.

The index charted above is based upon freight car loadings, electric power output, automobile assemblies (estimated by Cram's Reports) and the steelworks operating rate (estimated by STEEL). *Average for 1926 equals 100, weighted as follows: Steel rate 40, and car loadings, power output and auto assemblies each 20.*

Index of Activity Lower, But Steel Output Still Gains

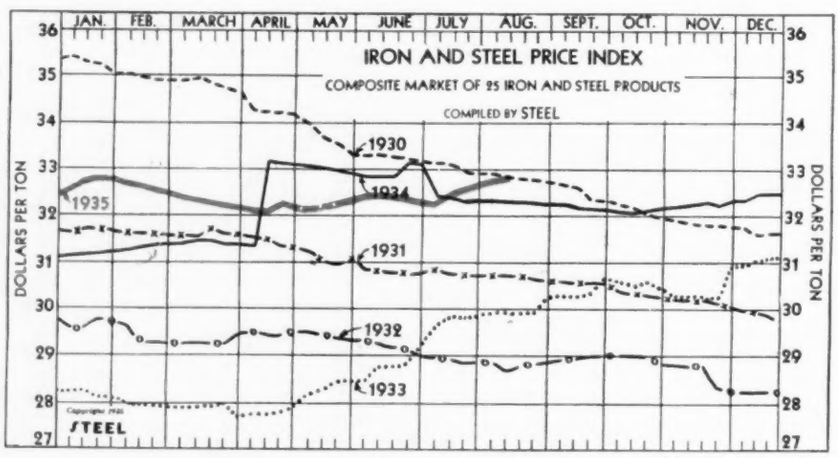
STEEL stands out in front as the dominant factor in the present business situation. While many important barometers have fluctuated uncertainly through July and early August, the curve of steelworks operations has pointed steadily upward in six consecutive weeks.

Part of steel's prominence is due to the temporary eclipse of the automobile industry. Motordom is in the midst of a vacation, which has resulted in a sharp reduction of output. Automobile assemblies in the week ending Aug. 12 dropped to 48,067. This is the first week in 1935 in which automobile production has fallen below that of the corresponding week of 1934.

The contrast noted in the two principal service barometers in recent weeks continues to be sharply defined. Revenue car loadings, leading indicator in the service of freight transportation, still are sluggish, considering the average rate of industrial activity. On the other hand, electric power output, the index of the service of power, light and heat, continues at almost record levels. On the basis that the average for 1926 equals 100, freight traffic now is about 57 and electric power output is 150.

Undoubtedly a comparison of freight car loadings for 1926 and 1935 is misleading as an index of freight traffic because of the important diversion of shipments to trucks in recent years. One possible effect of the federal transportation law just enacted may be a compilation of weekly freight shipments by motor truck. This would be a valuable barometer.

Steel's activity index dipped sharply in the week ending Aug. 10 to 73.3, due largely to the curtailment in automobile output.

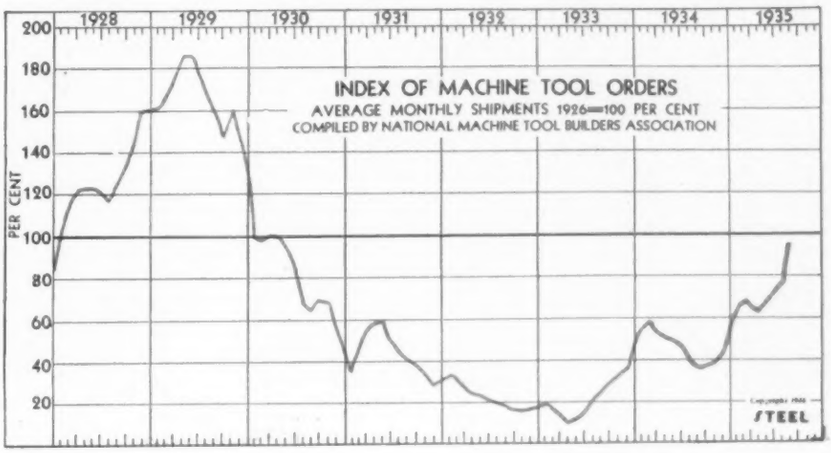


1935	
Aug. 10	$32.64
Aug. 3	32.59
July 27	32.55
July 20	32.42
July 13	32.40
July 6	32.39
June 29	32.39
June 22	32.40
June 15	32.41
June 8	32.45
June 1	32.43

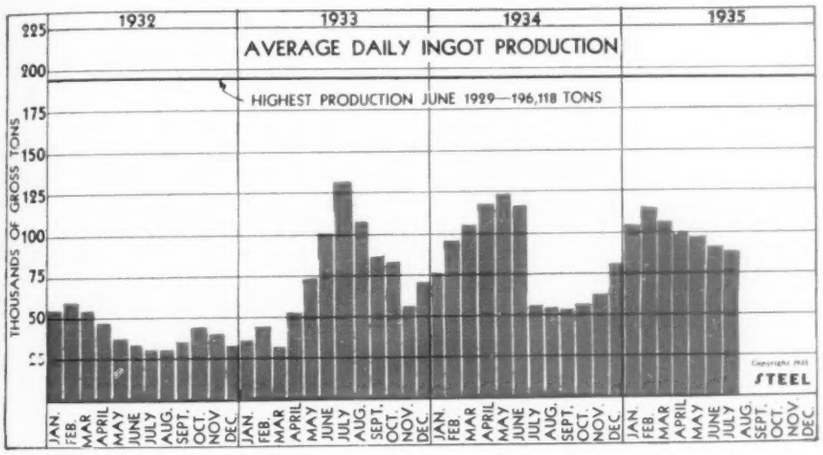
1934	
Aug. 11	$32.23
Aug. 4	32.28
July 28	32.28
July 21	32.28
July 14	32.33
July 7	32.38
June 30	33.15
June 23	33.16
June 15	32.84
June 9	32.83
June 2	32.81

Machine Tool Orders Highest Since 1929

	1935	1934	1933	1932
Jan.	61.3	56.5	18.3	32.8
Feb.	61.5	58.2	15.2	30.4
March	60.3	50.9	11.1	23.9
April	60.3	48.5	8.3	20.6
May	67.1	46.8	10.6	20.8
June	76.7	42.6	15.5	21.7
July	94.7	38.6	22.4	18.7
Aug.	.....	37.1	27.9	16.8
Sept.	.....	37.4	30.9	15.3
Oct.	.....	40.5	33.3	15.7
Nov.	.....	44.2	38.0	16.4
Dec.	.....	54.1	51.0	17.6



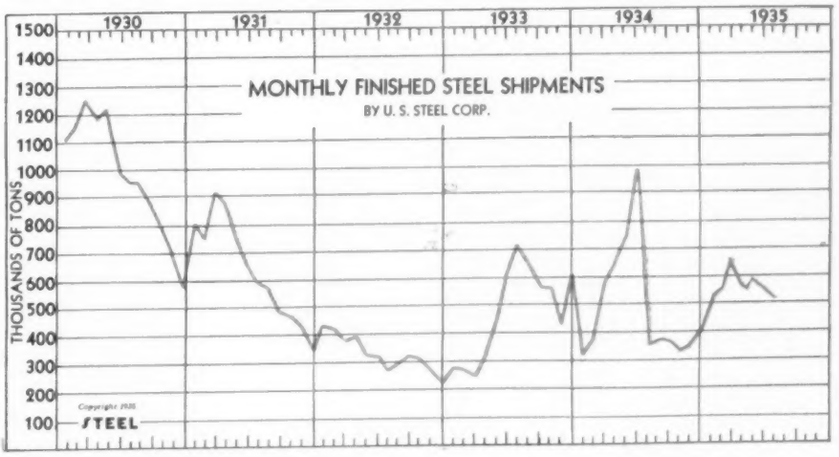
July Ingot Output Shows Slight Drop



	Gross Tons		
	1935	1934	1933
Jan.	106,353	73,968	39,110
Feb.	115,740	92,164	44,709
March	110,313	103,646	33,268
April	101,558	117,443	53,817
May	97,624	125,907	73,201
June	89,236	117,672	98,632
July	87,316	59,578	126,734
Aug.	.....	51,161	106,058
Sept.	.....	50,759	87,811
Oct.	.....	54,885	80,188
Nov.	.....	61,947	58,507
Dec.	.....	78,570	71,944

Finished Steel Shipments Decline in July

	Gross Tons		
	1935	1934	1933
Jan.	534,055	331,777	285,138
Feb.	583,137	385,500	275,929
March	668,056	588,209	256,793
April	591,728	643,009	335,321
May	598,915	745,063	455,302
June	578,108	985,337	603,937
July	547,794	369,938	701,322
Aug.	.....	378,023	668,155
Sept.	.....	370,306	575,161
Oct.	.....	343,962	572,897
Nov.	.....	366,119	430,358
Dec.	.....	418,630	600,639



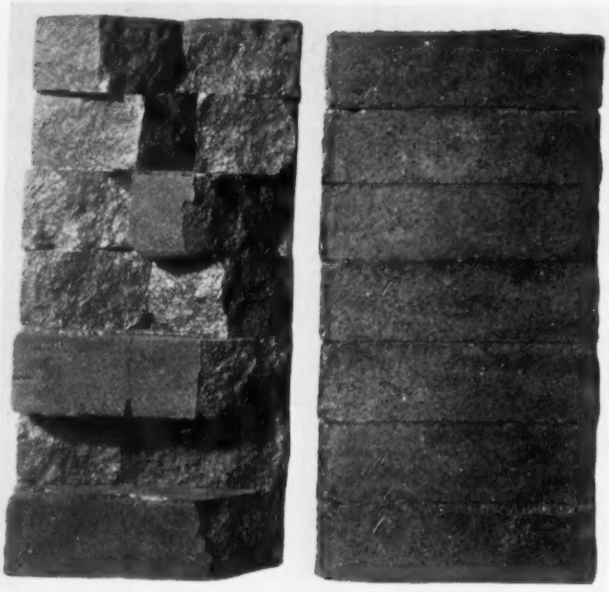


Fig. 1—Chrome brick after spalling 10 cycles. At left is shown regular chrome brick which lost 30.65 per cent in weight. At right is shown Ritex chrome brick which lost no weight

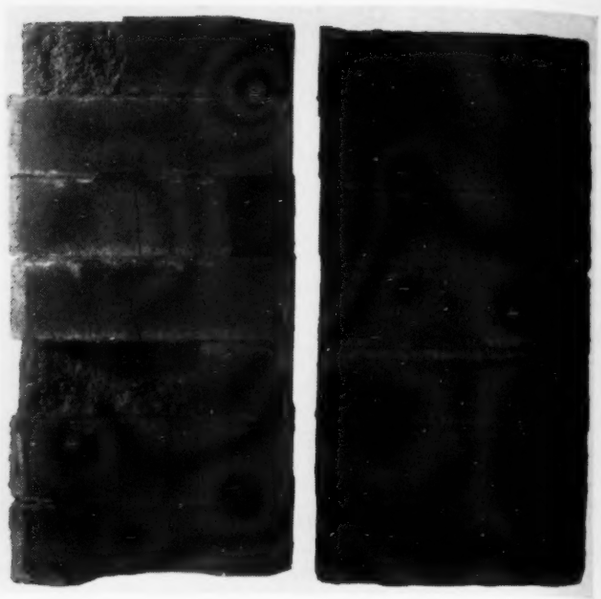


Fig. 2—Chrome brick after spalling 20 cycles. At left is shown chrome-magnesite brick which lost 12.13 per cent in weight. At right is shown Ritex chrome brick which lost no weight

A New Application

Of the Ritex Process to the Manufacture of Chrome Brick

BY R. P. HEUER
Director of Research,
General Refractories Co.

THE manufacture and general properties of Ritex brick were first described by A. E. Fitzgerald in an article entitled "New Developments in Unburned Magnesite Brick" which appeared in the December, 1931, issue of *Mining and Metallurgy*. At that time the process had been in commercial operation more than two years and the utility of unburned brick had been amply demonstrated. The method of manufacture shown in the flow-sheet in Fig. 5 was then used. It differed considerably from the older method of making burned magnesite brick.

The new process was characterized by three novel developments: First, a proper grinding, grading and blending of the magnesite particles to develop a desired grain sizing in the mix used for making the brick; second, the use of high forming pressures up to 10,000 pounds per square inch for molding the brick to produce a strong, dense, interfitting structure; third, the use of a refractory bonding agent in the brick mix which, upon drying the molded brick, developed suitable physical strength to permit the use of the brick without kiln firing.

Brick so produced were found to have many advantages. They had mechanical strength comparable at all temperatures to that of the kiln-fired brick and possessed equal refractoriness. The time consumed in manufacture was cut to a fraction of that formerly required, making possible quick delivery of special shapes without carrying such brick in stock. The new brick were of better workmanship, especially when large difficult shapes were manufactured, since the shrinkage, cracking and warpage which occurred in kiln fired brick were absent.

Supplementing these general advantages, one particular and outstanding advantage was obtained in the Ritex brick, namely, an improved resistance to spalling due to the elastic structure developed in these brick by the new manufacturing process. Up until that time it had been customary in metallurgical and other furnaces to avoid the use of magnesite brick in places where spalling was a factor. In so doing it was necessary to use silica, fireclay or high alumina brick which lacked the desirable basic character of magnesite. While these acid refractories had desirable spall resistance they were of less refractoriness and more readily attacked by the basic oxides common to metallurgical furnaces such as lime, iron oxide, copper oxide, lead oxide, etc. Still it was more economical to put up with the shortcomings of the acid refractories than to suffer the excessive spalling of magnesite.

With the advent of a spall-resistant magnesite brick this condition was changed so that for many uses the basic brick could be profitably substituted for the acid brick formerly employed. Thus the Ritex magnesite brick found use in basic open hearth furnaces not only below the slag line where burned magnesite brick were formerly used but they also economically displaced silica brick above the slag line in front walls, back walls, bridgewalls, ports and downtakes. They were used in electric steel furnaces. They displaced fireclay brick in metal mixers and heating furnaces, gave improved service when used in place of burned magnesite brick in soaking pits.

In the roofs of large copper smelting furnaces they gave as much as seven times the life of silica brick and in copper converters and refining furnaces they yielded satisfactory service. The unburned magnesite brick displaced high alumina brick in rotary cement and dolomite kilns.[1] They were used as checker brick in glass melting tanks to obtain resistance to alkaline

[1] Sonntag, *Rock Products*, 1932, Vol. 35, No. 22; Sonntag, *Rock Products*, 1934, Vol. 37, No. 12; Heuer, *Rock Products*, 1934, Vol. 37, No. 12.

dusts, also as ladle brick for special purposes and numerous other applications. As a result the production and use of the Ritex magnesite brick grew until at present they are the most widely used magnesite brick in America. Fig. 8 shows the steady year-by-year growth in annual production which the Ritex method has experienced since 1928 despite the adverse business conditions prevailing during much of this period.

At the time the Ritex process was first applied to magnesite brick, the possibility of using it for chrome, silica, fireclay and other refractories was recognized. As a natural consequence the chrome problem was given further laboratory study. Suitable chrome ores were found and desirable binders worked out. The grinding and preparation of the brick mix, the brick pressing operations, the drying process, etc. were all developed. Finally a laboratory product was produced and found to be of outstanding quality. Following this, the process was developed to full-scale plant operation.

Chrome Requires Special Equipment

Numerous changes in the Ritex Magnesite plant equipment were necessary to take care of the peculiarities of chrome ore. For example, the problem of pressing chrome brick at high pressures was more difficult than magnesite brick since chrome ore tended to develop laminations or pressure cracks in the brick due to air entrapped under the high pressure. To overcome this it was found necessary to equip the brick-forming presses with de-airing equipment to evacuate the air from the brick mold just before the high forming pressure was applied. With this modification pressure cracks were eliminated. Similar adjustments were necessary in other steps of the manufacturing process. After these were made, the full-scale plant brick seemed satisfactory. The final brick were then tested in comparison with the laboratory brick and found to be of comparable quality and good uniformity.

Table I

Chemical analysis, per cent	Ritex chrome brick	Regular burned chrome brick
Loss on ignition	2.80	0.06
SiO_2	5.10	8.86
FeO	12.20	13.85
Al_2O_3	18.13	26.00
CaO	trace	trace
MgO, by diff.	31.80	15.46
Cr_2O_3	29.88	35.77
Pyrometric cone equivalent value		
Cone	Above 41	Above 41
Degrees Cent.	Above 1970	Above 1970
Degrees Fahr.	Above 3578	Above 3578
Bulk specific gravity	3.18	2.95
Open pores, per cent	8.58	23.17

In order to evaluate the commercial possibilities of the new Ritex chrome brick a complete series of tests were made comparing them with chrome brick of regular manufacture as made by the kiln-firing process. All samples tested were representative of commercial brick as supplied to the consuming trade and were in no way experimental or laboratory samples. Chemical analysis, porosity and fusion point were first determined, the results obtained being shown in Table I.

One important difference between the chemical analysis of the Ritex chrome brick and the regular chrome brick was the high percentage of magnesia in the former. This was obtained by the specific addition of dead-burned grain magnesite to the Ritex mix. To be strictly accurate the new brick should be called a chrome-magnesite refractory. The advantages of magnesite additions to chrome brick made by kiln firing process had previously been reported by other investigators. Our experiments with unfired refractories showed the same to be true when using the Ritex methods.

The comparative physical strength of the two kinds of test brick was determined at room temperature by crushing standard 9-inch brick with a suitable force applied to parallel planes on the 4½ x 2½-inch face of the brick. The data, Table II, showed that the unburned brick were of sufficient strength for shipping and handling when compared with burned brick. The strength of the brick at high temperature was compared by subjecting them to a static load of 2 kilograms per square centimeter (approximately 28.4

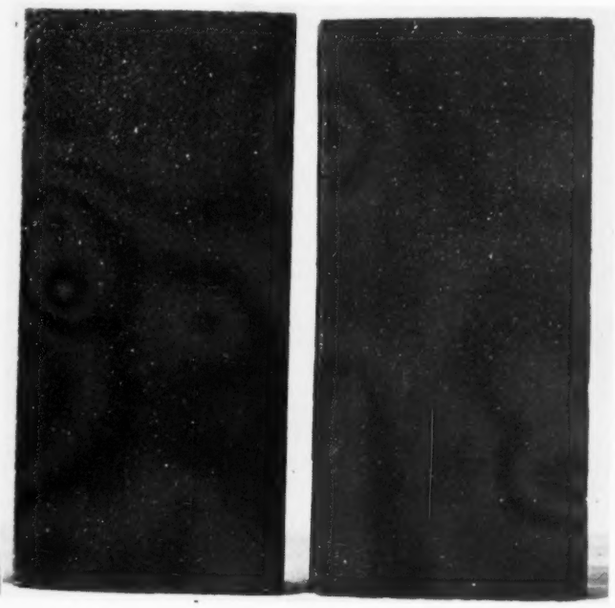


Fig. 3—Chrome brick after reheating to 1650 degrees Cent. for five hours. At left is shown Ritex chrome brick. At right is regular burned chrome brick

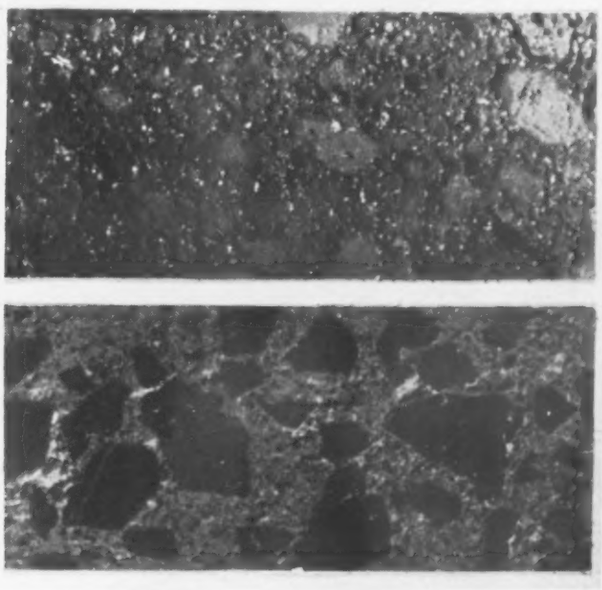


Fig. 4—Polished sections of chrome brick magnified five to six diameters. At top is regular burned chrome brick and at bottom is Ritex chrome brick

pounds per square inch), with increasing temperature until failure occurred. The results, Table II, indicated an unusual load-carrying capacity of the Ritex chrome brick. The test was carried to 1625 degrees Cent. (2957 degrees Fahr.), the limit of the testing apparatus, without failure of the brick. The test specimen upon cooling showed no permanent linear deformation. The burned chrome brick showed the customary failure in shear at 1505 degrees Cent. (2741 degrees Fahr.), and showed an initial deformation under load at 1405 degrees Cent. (2561 degrees Fahr.).

Test Results Shown in Curves

The apparatus used for these load tests was so arranged as to trace a curve indicating on an enlarged scale any change in the length of the test specimen as it was subjected to the static load and increasing temperature. The comparative curves for the two kinds of brick are reproduced in Fig. 6 and show how the less desirable burned brick starts to deform at moderate temperature and fails by shearing whilst the Ritex brick continues to expand against the applied load to the highest temperature of test.

A further indication of the comparative physical characteristics of the brick at high temperatures was obtained by reheating standard 9-inch brick to 1650 degrees Cent. (3002 degrees Fahr.), for five hours in laboratory furnaces. After the test, the brick were cooled to room temperature and the change in linear dimension noted. The regular burned brick showed a permanent shrinkage as much as 2.05 per cent, whereas the Ritex brick showed a linear expansion of approximately 0.3 per cent. In most of these tests the burned brick showed excessive warping and shrinkage cracks as illustrated in Fig. 3 showing brick which had been through such tests. The Ritex brick were free from

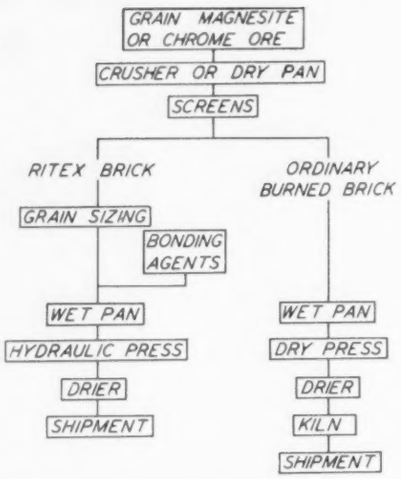


Fig. 5—Flow sheet showing Ritex process in comparison with ordinary basic brick process

cracking.

These favorable results shown by the Ritex chrome brick with respect to crushing strength, refractoriness under static load and volume stability on a high temperature reheat test were due in great measure to the dense physical structure which the brick possessed. The data of Table I show an open pore space of only 8.58 per cent in the new brick compared with 23.17 per cent porosity in the older type brick. This dense structure can be seen in the photographs of Fig. 4 taken at a magnification of five to six diameters on polished surfaces of the two types of brick. The structure of the burned brick shows large dark patches indicative of the pores in the brick. The ground-mass of the burned brick shows poor grain-sizing and imperfect interfitting of the refractory particles. The Ritex brick shows an unusually dense structure, free from large open pores and with desirable interfitting of the constituent grains. Such a dense structure is good where resistance to slag and metal attack are important.

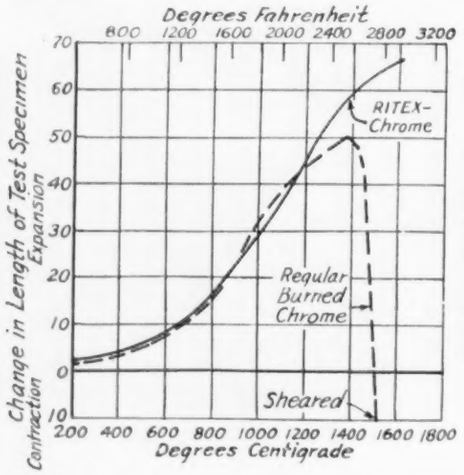
An interesting confirmation of the dense nature of the brick was further obtained by testing the comparative permeability of the brick to gas. In this test a given volume of air was allowed to pass under constant pressure through a brick 2½ inches thick, a constant area of 40.5 square inches, 9 x 4½ inches, being available for the purpose. The method was that described by Pressler[2]. A series of determinations were made under pressures varying from ½-inch of water to 8 inches of water, the time required for a given air flow being noted. From these data a constant, K, was calculated using the following formula:

$$K = \frac{\text{Volume of flow x thickness of brick}}{\text{Area of brick x time of flow x pressure differential}}$$

Expressing time in seconds, the linear dimensions in centimeters and pressure in centimeters of water, K for the Ritex chrome brick averaged 0.0018 and for several samples of burned chrome brick K averaged 0.30. The burned chrome brick allowed the gas to pass more than one hundred times faster than did the unburned brick.

This desirable density of the new brick which provided physical strength and resistance to penetration by external bodies was obtained without sacrificing the spall resistance of the brick. Indeed, during the entire laboratory development work, the resistance to spalling was made of paramount importance. From previous experience with the Ritex process in the manufacture of magnesite brick an improved resistance to spalling was expected of the chrome brick. Laboratory tests

[2] E. E. Pressler, *Journal of the American Ceramic Society*, 1924, Vol. 7, No. 3.



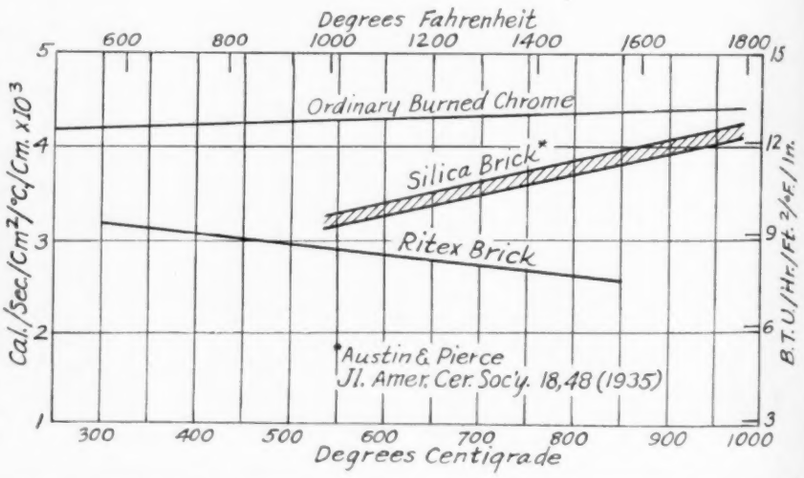


Fig. 6 (at left)—Shows load test curves at high temperature. Fig. 7 (at right)—Shows thermal conductivity of chrome brick

fulfilled this expectation. The comparative tests were made using the apparatus of the tentative standard spalling test of the American Society for Testing Materials, C 38-34T.

Seven 9-inch brick of the two brands to be compared were built into a test panel approximately 18 inches wide, 18 inches high and 4½ inches thick. The brick were laid in stretcher courses so that the two brands formed two sections side by side approximately 9 inches wide and 18 inches high. Joints were filled with high temperature chrome cement. The brick panels were backed up with 4½ inches of insulating brick. Each panel was supported in a movable frame suspended from a carriage traversing a monorail system above the test furnaces.

Actual Service Condition Simulated

Two test furnaces were used. In the first furnace, the face of the test panel was heated slowly to 1650 degrees Cent. (3002 degrees Fahr.), maintained at this temperature for 24 hours and then allowed to cool slowly with the fuel supply cut off. This treatment served to place the test brick into a fired condition simulating that of actual service. After this reheating the test frames were transferred to a spalling furnace where the surface of the panels was subjected to a spalling cycle of hot gases at 1200 degrees Cent. (2192 degrees Fahr.), for 10 minutes followed by a blast of air at room temperature for 10 minutes. After 10 such cycles the regular burned chrome brick were badly cracked and shattered. They were taken from the panel, all loose fragments were detached and the brick were weighed to determine the spalling loss. It proved to be 30.65 per cent for the 10 cycles. The Ritex brick tested in the same manner showed no shattering or loss in weight and the brick were entirely free from spalling cracks.

The superiority of the Ritex brick over the burned brick was so pronounced that a question arose as to whether the improvement was due to the Ritex process alone, or whether the use of magnesite in the new brick was a contributing factor. To prove this point the test was repeated using, instead of the ordinary burned chrome brick, a burned chrome-magnesite brick having a quantity of added magnesite similar to the Ritex chrome brick. After 10 cycles neither brick showed any loss. The addition of magnesite was thus identified as a contributing cause for the increased spall resistance. The test was continued for a total of 20 cycles. Thereupon the burned chrome-magnesite brick shattered and cracked. They lost 12.13 per cent in weight. The Ritex chrome brick were still unaffected. Figs. 1 and 2 show the condition of the various bricks after these tests.

Table II

	Ritex chrome brick	Regular burned chrome brick
Cold crushing strength, lbs. per sq. in.	4527	4296
Temperature of first deformation, under static load of 2 kg. per sq. cm., degrees Cent.	Above 1625	1405
Temperature of shearing, under static load of 2 kg. per sq. cm., degrees Cent.	Above 1625	1505

Supplementing these data, thermal conductivity tests were made comparing Ritex chrome brick and the ordinary burned chrome brick. Previous measurements with Ritex magnesite and ordinary burned magnesite brick had shown the burned brick to have somewhat greater conductivity. In view of the denser nature of the Ritex brick such a result was not anticipated. The conductivity measurements were made using the type of apparatus described by Wilkes[3]. The data obtained on the two kinds of chrome brick are presented in Fig. 7. For comparison similar measurements on commercial silica brick of average grade have been included. The burned chrome brick show a relatively higher conductivity and a positive temperature coefficient, that is with higher temperature the conductivity increases. The Ritex chrome brick show a relatively lower conductivity and this conductivity falls with increasing temperature. The Ritex chrome brick have a lower conductivity than commercial silica brick at temperatures exceeding approximately 500 degrees Cent. (932 degrees Fahr.).

[3] G. B. Wilkes, *Journal of the American Ceramic Society*, 1933, Vol. 16, No. 3.

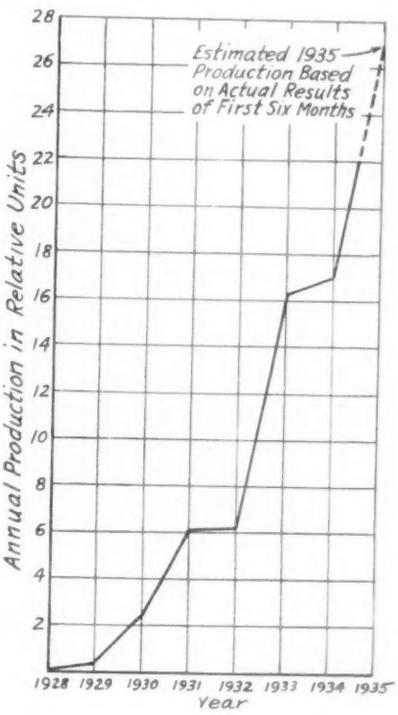


Fig. 8—Annual production of Ritex brick

In view of the current interest in furnace insulation and the conservation of heat by the use of refractory materials of low thermal conductivity these comparative data are of particular interest. In cases such as basic open hearth furnaces where basic brick are being substituted for silica brick above the slag line, such a change should not occasion any higher heat losses through the furnace walls.

Applications of New Chrome Brick

After this extensive scheme of plant development and laboratory testing was completed the new chrome brick were considered ready for the final step in the program, namely their use in commercial furnaces. It seemed probable that the new brick had two distinct fields: First, as a substitute for the older types of basic brick, either chrome or magnesite, and, second, as a new refractory in places where silica and fireclay brick had formerly been used under furnace conditions where basic brick were really required. Six years of practical experience with the Ritex process as applied to magnesite brick had indicated the importance of these fields. Additional laboratory tests showed that the Ritex chrome brick had physical and refractory properties which equalled and probably excelled the magnesite brick. In view of the lower selling price of chrome brick a large commercial application was indicated for the new brick. Subsequent developments later confirmed these views.

The first commercial trials were made in basic open-hearth steel furnaces. The new brick were used along the slag line in place of ordinary chrome and magnesite brick for the construction of front walls, back walls, monkey walls, bridge walls and similar parts where basic brick were required for slag resistance and where spall resistance was important but not critical.

For such uses the new brick were

(*Please turn to Page* 30)

American Society for Metals Announces Meeting Program

THIRTY-NINE technical papers have been scheduled by the American Society for Metals for presentation during its annual convention in Chicago, Sept. 30-Oct. 4 in connection with the seventeenth annual National Metal congress. According to the tentative program just announced, these papers will cover problems and developments in many branches of the metal industry.

Technical sessions will be held morning and afternoon during the five-day period, with the exception of Wednesday morning which has been set aside for the annual meeting of the society and presentation of the 1935 Campbell memorial lecture by H. W. McQuaid, metallurgical department, Republic Steel Corp., Youngstown, O. Simultaneous sessions will be held on Tuesday morning, this being a departure from the society's former policy of single sessions only.

All morning sessions will be conducted in the Palmer House, which is Metal congress headquarters, and all afternoon sessions will be at the Exposition Hall of the new International Amphitheatre, where the National Metal exposition will be housed.

Lectures on Heat Treatment

Special features of the convention program are two educational courses, one a five-lecture course on "Heat Treatment of Steel" and the other a three-lecture course on "Spectroscopic Analysis." The first will be conducted at Exposition Hall each afternoon by M. A. Grossmann, director of research, Illinois Steel Co., Chicago; the second will be presented at Exposition Hall on Monday, Tuesday and Wednesday evenings, by E. J. Martin, electrical section, research division, General Motors Corp., Detroit. The scheduling of evening lectures also is a new departure for the society.

The tentative program, with papers arranged by sessions, is as follows:

Monday, Sept. 30

MORNING

"On the Preparation of Iron and Steel Specimens for Microscopic Investigation," by F. F. Lucas, Bell Telephone Laboratories, New York.

"Oxalic Acid as an Electrolytic Etching Reagent for Stainless Steels," by G. A. Ellinger, national bureau of standards, Washington.

"On Naming the Aggregate Constituents in Steel," by J. R. Vilella, G. E. Guellich and E. C. Bain, United States Steel Corp., New York.

AFTERNOON

"Arc Welding of High-Carbon and Alloy Steels," by T. N. Armstrong, Norfolk navy yard, Portsmouth, Va.

"A Dilatometric Study of the Alpha-Gamma Transformation in High-Purity Iron," by C. Wells, R. A. Ackley and R. F. Mehl, Carnegie Institute of Technology, Pittsburgh.

"Some Transient Phase Changes During the Graphitizing Reaction," by H. A. Schwartz, H. H. Johnson and C. H. Junge, National Malleable & Steel Casting Co., Cleveland.

Educational course: "Heat Treatment of Steel," lecture No. 1, by M. A. Grossmann, director of research, Illinois Steel Co., Chicago.

EVENING

Educational course: "Spectographic Analysis," lecture No. 1, by E. J. Martin, electrical section, research division, General Motors Corp., Detroit.

Tuesday, Oct. 1

MORNING

"High Temperature Properties of Nickel-Cobalt-Iron Base Age-Hardening Alloys," by C. R. Austin, Pennsylvania State college, State College, Pa.

"Grain Size and Its Influence on Surface Decarburization of Steel," by D. H. Rowland and Clair Upthegrove, University of Michigan, Ann Arbor, Mich.

"Observations on the Oxidation of Steel," by M. Baeyertz, Illinois Steel Co., South Works, Chicago.

Simultaneous Session

"Chromium Steels of High Nitrogen Content," by Russell Franks, Union Carbide & Carbon Research Laboratories Inc., Niagara Falls, N. Y.

"Correlation of Failures from Embrittlement of 4 to 6 Per Cent Chromium Steel with the Notched Bar Impact Test," by H. M. Wilten, Texas Co., Port Arthur, Tex.

"Factors Influencing the Nature of the Cutting Speed-Tool Life Curve," by O. W. Boston, W. W. Gilbert and C. E. Kraus, University of Michigan, Ann Arbor, Mich.

AFTERNOON

"Physical Properties of Metals as Affected by Ammonia Synthesis," by H. L. Maxwell, E. I. duPont de Nemours & Co., Wilmington, Del.

"Influence of Carbon Content on the High Temperature Properties of Steels," by A. E. White, C. L. Clark, University of Michigan, Ann Arbor, Mich., and R. L. Wilson, Timken Steel & Tube Co., Canton, O.

"A New Heat-Resistant Alloy," by S. L. Hoyt and M. A. Scheil, A. O. Smith Corp., Milwaukee.

Educational course: "Heat Treatment of Steel," lecture No. 2, by M. A. Grossmann.

EVENING

Educational course: "Spectographic Analysis," lecture No. 2, by E. J. Martin.

Wednesday, Oct. 2

MORNING

Annual meeting of American Society for Metals.

Campbell memorial lecture, by H. W. McQuaid, Republic Steel Corp., Youngstown, O.

AFTERNOON

"Effect of Carbon, Oxygen and Grain Size on the Magnetic Properties of Iron-Silicon Alloys," by T. D. Yensen, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and N. A. Ziegler, West Penn Electric Co., Pittsburg.

"Relation of Hot Working to the McQuaid-Ehn Grain Size," by H. A. Grove, Republic Steel Corp., Canton, O.

"Austenitic Grain Size in Cast Iron," by D. W. Murphy and W. P. Wood, University of Michigan, Ann Arbor, Mich.

Educational course: "Heat Treatment of Steel," lecture No. 3, by M. A. Grossmann.

EVENING

Educational course: "Spectographic Analysis," lecture No. 3, by E. J. Martin.

Thursday, Oct. 3

MORNING

"Notes on the Solidus Temperatures in the Systems Iron-Tungsten and Iron-Molybdenum," by W. P. Sykes, General Electric Co., Cleveland.

"Influence of Deoxidation of the Aging of Mild Steels," by B. N. Daniloff and R. F. Mehl, Carnegie Institute of Technology, Pittsburgh, and C. H. Herty Jr., Bethlehem Steel Co., Bethlehem, Pa.

"Aging of Steel," by E. S. Davenport and E. C. Bain, United States Steel Corp., New York.

AFTERNOON

"Endurance of Case Hardened Gears," by O. W. McMullan, International Nickel Co. Inc., Bayonne, N. J.

"Pickle Pitting by Electrolytic Potentials as Affected by Scaling Temperatures," by C H. McCollam and D. L. Warrick, Timken Steel & Tube Co., Canton, O.

"Damping Capacity—a Factor in Fatigue," by G. R. Brophy, General Electric Co., Schenectady, N. Y.

Educational course: "Heat Treatment of Steel," lecture No. 4, by M. A. Grossmann.

Friday, Oct. 4

MORNING

"Hardening Characteristics of 1 Per Cent Carbon Tool Steels," by T. G. Digges and Louis Jordan, national bureau of standards, Washington.

"Interpretation of Torsion Impact Properties of Carbon Tool Steel," by G. V. Luerssen and O. V. Greene, Carpenter Steel Co., Reading, Pa.

"Contributory Effects of Furnace Atmospheres on the Grain Size of Molybdenum High Speed Steel," by Arthur Phillips and M. J. Weldon, Yale university, New Haven, Conn.

AFTERNOON

"Open-Hearth Temperature Control," by Earnshaw Cook, American Brake Shoe & Foundry Co., Chicago Heights, Ill.

"Effect of Deoxidation on the Rate of Formation of Ferrite in Commercial Steels," by D. L. McBride and R. F. Mehl, Carnegie Institute of Technoogy, Pittsburgh, and C. H. Herty Jr., Bethlehem Steel Co., Bethlehem, Pa.

"Equilibrium in the Reaction of Hydrogen with Ferrous Oxide in Liquid Iron at 1600 Degrees Cent.," by John Chipman, American Roling Mill Co., Middletown, O., and M. Fontana, E. I. duPont de Nemours & Co., Wilmington, Del.

Educational course: "Heat Treatment of Steel," lecture No. 5, by M. A. Grossmann.

METHODS AND MATERIALS

Alloy Forging Withstands Severe Service Conditions

That severe service for eight years in the high-pressure synthesis of ammonia has practically no effect on the physical properties of a high-grade chrome-vanadium steel forging is the conclusion of metallurgists at the national bureau of standards, Washington, who recently were called upon to examine a steel reaction chamber removed as a precautionary measure.

The bureau explains that study of the properties of a metal after practical service usually is very instructive, particularly if the conditions of use have been unusual or severe. In the present case, the examination was made to determine to what extent the steel had deteriorated in this particular service, namely, contact with hydrogen and nitrogen under a pressure of several hundred atmospheres and at a temperature of approximately 150 degrees Cent.

The tensile properties of the steel, containing 2.54 per cent chromium and 0.24 per cent vanadium, close to the inner wall of the chamber did not differ from those of the steel in the middle of the section, 2⅛ inches, and were identical with the results reported for the forging when it was made, it was stated.

The only suggestion of deterioration was a decarburized layer, 0.01 to 0.03-inch thick, on the inner wall of the chamber which, however, was too shallow to have any significant weakening effect on the strength of the cylinder. Other than this, there was no evidence of deterioration in the steel from the service to which it had been subjected.

S S S

Lubricating Bearings

Oil rather than grease usually is preferred for lubricating antifriction bearings operating under high speeds and low temperatures, and under other conditions where the housing permits its use. Animal and vegetable oils and mineral oils compounded with such oils should never be used, because in time they develop acidity and tend to oxidize rapidly with consequent thickening and sludging. A well refined straight mineral product is best by far for antifriction bearings used under the conditions mentioned.

S S S

Coolant Causes Stains

A large manufacturer of twist drills effected more efficient operation in its centerless grinder room by changing the coolant used in the machines. Although the coolant used seemed satisfactory, the management was obliged to reject a certain percentage of drills because they showed dark stains. An engineer for a large oil company traced the trouble to the use of a coolant with high acidity. After the proper coolant was employed, no further trouble was experienced.

S S S

Cranes Reduce Dock Costs

An interesting application of overhead cranes has been devised at the Mead-Johnson barge terminal at Evansville, Ind. To facilitate loading and unloading, a steel cantilever roof has been built to extend over the barges at the wharf. This structure provides parallel runways for two

De-insecting Chamber

RICE TREATING CHAMBER, built by Chicago Bridge & Iron Works' Birmingham, Ala., plant for the Guardite Corp., to be installed at the Louisiana State Rice Milling Co. property in Abbeville, La., to treat rice aganst infestation. The structure is 6 feet in height and width, 50 feet long and built of 0.375-inch plates designed to withstand operating vacuum of 29½ inches. The structure is entirely of welded construction, involving about 1750 linear feet of welding. The installation will include the above treating chamber, a gas mixing tank, vacuum pump and accessory controls. In the process the packaged rice is placed in the chamber under 29 inches of vacuum and a mixture of ethylene oxide and carbon dioxide admitted. After three hours exposure to the gas all insect infestation and insect eggs are killed

electric cranes, furnished by the Harnischfeger Corp., Mlwaukee, used for unloading materials in covered storage space and reloading on trucks and cars. The absence of center columns made possible by the cantilever construction permits operation of the two cranes in tandem, using three of four hooks where extremely long pieces must be handled. This new installation has made possible a reduction in the docking charges.

\$ \$ \$

Holes in Castings Cored With Steel Pipe and Wire

Coring small holes in heavy castings usually is accomplished with difficulties in removing the core material. According to a recent patent, however, these can be overcome by using a steel pipe wound with wire. The specific application is in steel castings where it was successfully applied in providing ¼-inch holes in a heavy casting over 4 feet long. Composition of the pipe and wire used should be the same as that of the casting. Size of wire and space between winding is such that the wire will be fused completely, but prevent the metal from cutting through the pipe.

\$ \$ \$

High Chromium Makes Iron Resistant to Oxidation

Irons containing about 15 per cent chromium resist oxidation up to approximately 1500 degrees Fahr., and the presence of 25 per cent chromium will extend the range of oxidation resistance to 1800 degrees Fahr. Castings containing high percentages of chromium are suitable for door frames, grate bars, pit covers, door castings, conveyor parts, and the like, where conditions require resistance to oxidation and growth.

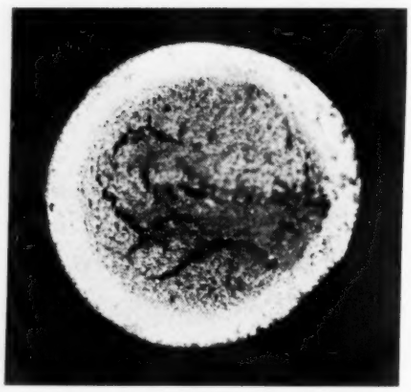
New Steel Has High Machinability And Unusual Carburizing Properties

AFTER extensive service tests, the Monarch Steel Corp., Indianapolis, is making its new cold finished steel known as Speed Case available in all bar sizes up to 3½ inch round. Speed Case is a new steel in the high-sulphur, high-manganese group, with properties, it is stated, which far exceed the older steels in this general classification. In connection with this development the company is in process of enlarging its cold finishing department to about five times the present capacity.

Physical Properties

Speed Case is an open-hearth steel containing approximately 0.20 per cent carbon and combines high strength with free machinability and special adaptability for carburizing. Its average tensile strength is in excess of 70,000 pounds per square inch in the hot rolled state and in excess of 85,000 pounds per square inch in the cold drawn state. The average yield in the hot rolled state is 52,000 pounds and in the cold drawn state 75,000 to 80,000 pounds. The percentage of elongation is 26 per cent in the cold drawn state and 37.5 in the as rolled, hot rolled condition; and the brinell hardness in the hot rolled state is 131 to 137 and from 150 to 156 in the cold drawn state. The Izod impact value test on the new steel averages from 60 to 80 foot-pounds.

Its machinability is about 15 per cent greater than that of S.A.E. 1112.



Fracture of new high-sulphur high manganese carburizing steel

It is carburized with the same treatment as with S.A.E. 1020 but in about two-thirds the time. It develops a case as hard as 66 on the Rockwell C scale and the case is uniform in hardness and depth. At the same time the core remains tough and shows no embrittling effect. Core torque is 43,000 pounds per square inch.

In exhaustive tests which were made to determine core strength, and core torque it has been found that in the carburized heat treated state the core has a strength of 43,000 pounds in a 1-inch round.

Another feature is that warpage of this steel as a result of carburizing is negligible so that parts may be machined with less than the usual allowance of stock to be removed by finish grinding after carburizing.

Steps Up Production

Unusual results are said to have been obtained with the new steel in consuming plants. In one plant which changed over to the new steel the life of cutting tools has been increased 8 times. Another plant is turning out 2400 pieces on an automatic screw machine in the same time required for producing 1800 when bessemer screw stock was used.

A plant making small carburized gears has increased production about 25 per cent by using the new steel and gets a 3-point higher case hardness along with a tougher core. Substantially the same performance has been obtained by manufacturers of automobile parts such as king pins, shackle bolts, piston pins etc., while at the same time rejections for warpage have been reduced to practically nil. Another plant making carburized starter gears has doubled production with the new steel, at the same time getting greater case hardness with a tougher core.

The new steel is recommended as an all-purpose steel. One plant which formerly carried bar stock in nine different grades of steel now is stocking only two kinds, the new steel and S.A.E. 1045. The new steel is designated as X1525.

Physical Characteristics of Speed Case Steel

From Tests of 1-Inch Round Samples

	Hot rolled	Hot rolled and ground	Hot rolled ground and polished	Cold drawn with 1/16-inch draft
Tensile strength, pounds per square inch	72,400	72,600	72,600	85,200
Elastic limit, pounds per square inch	48,700	50,700	48,700	80,000
Elongation in 2 inches, per cent	37.5	32.5	34.2	26
Reduction of area, per cent	60	60	58	48
Torsion, pounds per square inch	36,500	36,500	37,000	43,000

Other Characteristics

Density of case, Rockwell C	62-66, averaging 65
Core torque, pounds per square inch	43,000 average
Brinell hardness	131-137 for hot; 150-156 for cold rolled
Izod impact, foot-pounds	60-80
McQuaid-Ehn grain size	No. 4, plus or minus 0.001 on A. S. T. M. chart

etting new and exclusive standards of performance

REPUBLIC
ELECTRIC WELD
CASING • TUBING

Republic Electric Weld Casing and Tubing have been setting new and exclusive standards of performance in every field where they have been used. • They are manufactured by a patented process of electrical resistance welding—a process that results in many advantages in the finished pipe, such as high yield point in the steel, perfect roundness, uniform wall thickness, freedom from scores, scratches, slivers and seams on the exterior surface, and also freedom from scale inside and outside. • This means uniform strength of wall and uniform thickness of metal under the threads, minimizing chances of failure due to collapse or pulling out at the joints. It means the utmost in dependability in every well where this better casing and tubing are used.

Republic Steel
CORPORATION
GENERAL OFFICES · · · YOUNGSTOWN, OHIO

Manufacture of Chrome Brick

(*Continued from Page 25*)

quite satisfactory. Their low porosity and low permeability, their freedom from shrinkage at high temperature and their lower thermal conductivity as compared with other types of chrome and magnesite brick proved particularly advantageous. The new brick were also tried in basic open hearths above the slag line as a substitute for silica brick in front and back walls, around the ports of gas fired furnaces and in the end walls and downtakes to the checker chambers. In such places silica brick had always found extensive use in spite of the fact that they were acid in nature and therefore chemically unsuited to the conditions prevailing in a basic open hearth furnace. For many furnaces however the life obtained with silica brick was quite short. Frequent repairs were necessary involving an expense for new refractory materials and labor as well as an important but somewhat intangible charge due to time and production lost by the furnace and its auxiliary apparatus while repairs were being made.

In spite of these shortcomings silica brick had continued in use due mainly to their relatively cheap price and good physical properties. Careful study of the various cost items indicated that the new chrome brick could economically displace silica brick in many parts of the basic open-hearth furnace above the slag line if they gave service from two to three times that given by silica brick. Trials were conducted in front walls to determine this relative service.

Preliminary Trials Successful

At first the new brick were only used for about eight courses of exposed brickwork above the banks of the furnace. The silica brick used above the chrome brick seemed to cut away much more rapidly than the chrome. To overcome this the number of chrome courses was increased until at last no silica brick were used in the front walls. With this construction a sufficiently long life was obtained to make the new brick practical. Less repairs were necessary to the front walls and less time was lost with the furnace. Using these basic walls, less dolomite was necessary for the banks of the furnace because the cutting effect of the wash from the silica front walls was eliminated. Similar trials were made in back walls with similar results. With sloping backwalls it was found desirable to use the new brick beneath the dolomite covering especially at the top of the backwall where the underlying brick were frequently exposed with no dolomite protection. Tests were made in bulkheads and downtake flues. Here again sufficiently longer life was indicated particularly in the gas bulkheads of producer gas furnaces and the air panels on the pit side of oil-fired furnaces. Not only were the refractory costs reduced but fuel savings were also obtained since it became possible to use insulation on these important parts and eliminate the water cooling frequently employed when silica brick were used.

After these preliminary commercial trials were completed the new chrome brick were offered publicly to the trade. The results which followed have been quite satisfactory. In less than one year Ritex chrome brick have found their way

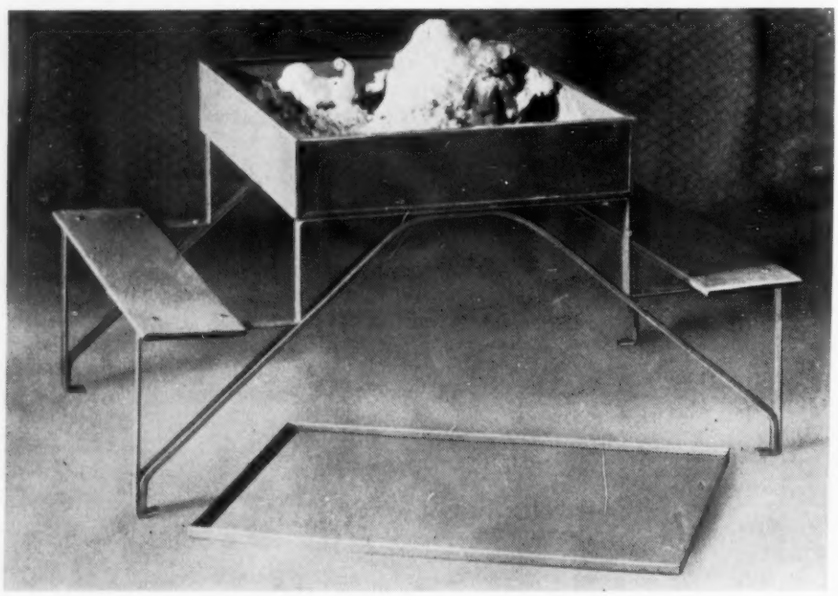
LARGE USES OF STEEL IN SMALL WAYS

293rd Article ◆ Play Tables

MANUFACTURE of toys and amusement devices for children represents a never-ending source of demand for steel and for equipment and materials used in fabricating them. Many of these devices are of novel character, initiated and developed through the exercise of considerable ingenuity.

One of the latest is based on the fact that all children like to play with sand as well as with toys. As shown in the accompanying illustration, it is a combination sand box, play table and toy chest. The box has sides high enough to keep the sand from falling out and is mounted on a steel support provided with wood seats to keep the children off the damp ground. It is provided with a lid to protect toys and sand from rain; the lid also may be used to convert the box into a table. In the winter this unit, minus the sand, becomes a major indoor toy.

Box and cover are of 24-gage sheet steel, while legs are of steel channels and flats spot welded together to form a rigid truss. The surface finish is baked enamel. Weight of the unit is about 25 pounds. A canopy may be purchased to go with the device, in which event the consumption of steel is increased. The canopy is of hemmed canvas with a frame of $\frac{3}{16}$-inch round steel and held by a $\frac{7}{16}$-inch steel round fitted into a cast iron bracket bolted to the box and legs.



—Photo courtesy Gross-Given Mfg. Co., St. Paul, Minn.

This combination sand box, play table and toy chest is of sheet steel, channels and flats, welded together

An Effective Aid in Combatting "DOWN" TIME ...Due to Frequent Tool Resharpening

EQUIPMENT idle ... production time lost ... while tools that dull too rapidly are being changed!

That's a condition every shop executive is seeking to avoid, because operating delays are *costly.*

To help prolong intervals between tool regrinds, we suggest the effectiveness of Sunoco Emulsifying Cutting Oil. Its long service record shows *outstanding* performance. Results are seen in longer runs per tool grind, less lost time for resetting—and reduced tool maintenance costs.

Machine Tool Efficiency is Higher with SUNOCO

With Sunoco, machine tools achieve smooth and chatterless operation, greater accuracy, greater output and fewer rejects. Not without good reasons has this cutting oil been adopted so widely in the industry!

Faster Grinding without Increased Wheel Wear

In grinding, Sunoco makes possible faster stock removal without increasing wheel wear and yet reduces to a minimum the danger of burning the work. Even at high surface speeds, abrasive wheels stay cool.

Sunoco can be used over and over again without oxidizing or developing obnoxious odors.

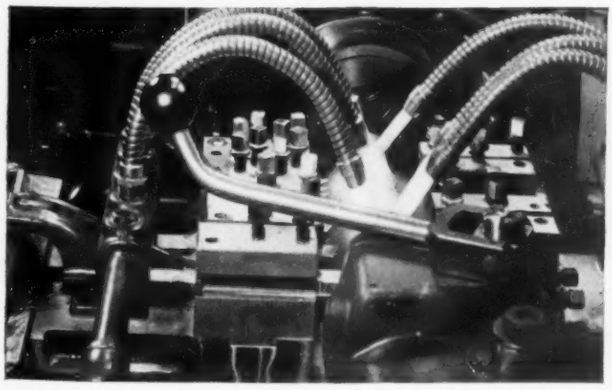
Operation: Machining wheel end of automobile axle shaft.
Machine: Monarch "Magnetic" Lathe.
Lubricant: 1 part Sunoco to 15 parts of water.

Courtesy of
Monarch Machine Tool Co.
Sidney, Ohio

SUNOCO
EMULSIFYING
CUTTING OIL

Operation: Grinding differential pinions.
Material: Chrome-nickel steel.
Machine: Bryant Hole Grinder.
Coolant: 1 part Sunoco to 40 parts of water.

Courtesy of
Buck & Hickman, Ltd.
London, England



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into regular use in a majority of the important open hearth-shops in this country. The brick seem chemically and physically suited to the conditions prevailing in the basic open-hearth. They can be used above and below the slag line and find their best application in the construction of front walls and back walls all the way up to the main skewbacks, in monkey walls, bridgewalls, port facings, end walls and downtakes. For the conventional rebuild of a 125-ton furnace without renewing the furnace bottom, as many as ten thousand 9-inch brick may be economically used. For many types of furnaces other than basic open-hearths the new refractory may be advantageously employed in place of regular burned chrome brick or acid refractories. In soaking pits, mill furnaces and other metallurgical furnaces where resistance to corrosive oxides is required in conjunction with spall resistance, the new brick find particular application.

Open-Hearth Roof Requirements

At the present time the new chrome brick have not been recommended as a substitute for silica brick in open-hearth roofs. Such furnace roofs would be required to yield from 750 to 1500 heats in order to be practical. Sufficient progress has not been made to attain this objective in our large furnaces. The problem requires solution from three viewpoints to obtain: First, an improved basic refractory possessing the desired physical properties; second, an improved furnace roof construction to accommodate the new refractory; third, a solution of the operating problems attending such a radical departure in open-hearth construction. Improved basic brick are already available and bid fair to solve much of the problem. Improved roof construction is available. Steelmakers are making a considerable study of the operating problems and have already had encouraging success with basic roofs.[4] The results of these studies will be awaited with great interest to determine their ultimate effect upon open hearth furnace construction.

Issues New Specifications

Specification No. 500-35, covering "Heat Treated, Rail Joint Bars Manufactured from Scrap Steel Railroad Car Axles," has just been issued by the technical committees of the Association of American Steel Manufacturers, according to T. Walley Williams, recording secretary. Copies of the specification may be obtained by addressing the association's office at 616 Investment building, Pittsburgh.

[4] Heger, Sonntag and Leineweber, *Stahl und Eisen*, 1935, Vol. 10, p. 265.

WELDING, et cetera . . .

BY ROBERT E. KINKEAD

IN THIS column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

Tough Minded

THE welding industry is prosperous because it is aggressive and highly competitive. Like Mr. Kettering's automotive industry, it lives dangerously; but it lives. The path leads *from* the door of the successful and not to it and is beaten smooth by men going out after business. Either a man or a company in the welding business has to do a good job or be crowded out by someone who can and will pay attention to business.

The use of welding expands rapidly because industrious and capable men spend a tremendous amount of energy and money to make it expand. No one buys the products or the service of the industry except for the reason that he has been convinced that it would cost him more, or he would profit less, if he spent his money elsewhere. The order numbers for unsolicited business for a year for the entire industry could be written on the back of a postage stamp.

Such conditions of free, open and vigorous competition breed tough mindedness, self reliance, and business capability. Rapid technical progress and practically no unemployment for the last year in the industry are facts which are creditable to the industry.

No one in the welding business is afraid of change or of new and better methods of doing any part of its job. The survival and success of the industry is based on the very fact that changes have been made and will be made the instant they promise better results. But being practical and tough minded, the leaders of the industry are impatient with fuzzy minded efforts of some of the members of the administration to meddle with this or any other business.

Weld Inspection

Inspection of welding during the actual operation adds safety and certainty to the results. A force of competent welding inspectors is maintained by the Hartford Steam Boiler Inspection & Insurance Co. To use these inspectors it is necessary to state in advance just how the welding is to be done and what test results will be required. The inspector will see that the methods are followed and report on the test results.

Such practice is strikingly different from sending a blueprint out to the shop with "Weld here" marked on it. In cases where failure of a weld means loss of lives and great property damage, some kind of inspection is advisable. Methods specifications must be issued, however, before inspection can be effective.

Sparks and Flashes

There is no nondestructive test for fillet welds made with arc welding. There is no need for such a test where metal is applied in one layer. Visual inspection is entirely conclusive as to whether or not the fillet weld is properly made. Responsible inspection of multiple layer fillet welds will give satisfactory assurance of proper quality. It is a fact that an experienced man can tell whether a layer of weld metal is good or bad by merely looking at it. And, one man can look at several miles of weld in one day so that the cost is not excessive.

* * *

Thermit pressure welds to make railroad rails over 2000 feet long receive endorsement of railroad engineers. The old bugaboo of "snaking" of the track resulting from temperature changes seems to have been an imaginary difficulty. Continental experience forecast a successful result. Thermit welding is an old process, yet new applications are continually being made, particularly where mechanical pressure is used.

MODERN ROLL TECHNIQUE

The whole world turns to Phoenix Rolls. The artist's drawing above shows a shipment of rolls to India. Phoenix Rolls are also in active service in Australia, England, Japan, Canada, Mexico and in fact in most countries where rolls are purchased on a basis of dollar and cents service obtained.

PHOENIX ROLLS

PHOENIX STEEL, for unusual strength; PHOENIX "A" (steel alloy), for strength and wear; PHOENIX METAL—PHOENIX "K", for strength, wear and finish; PHOENIXLOY (uniformly hard), for flat rolling where high finish of extremely thin gauge of material is required to be free from all marks or defects. Also tube mill rolls of quality material best suited to the kind of service required; PHOENIX CHILL; PHOENIX NICKEL CHILL, for all flat rolling requiring finish.

PITTSBURGH ROLLS CORPORATION

PITTSBURGH, PA.

• THE REVOLUTION *nobody knows*

In six years, a revolution has quietly come to pass—a profound revolution in the production world. So swiftly has it occurred that few yet realize its import.

Yet because of it, production methods in America can never be what they have been.

The six years since 1929 have seen epoch-making advances in machine tools and accessories. For the first time, at the Machine Tool Show of 1935, these remarkable developments will be shown: 900 different primary machines, of 600 different types, in operation beneath one roof for those who seek the way to better products at lower costs that will profitably provide more goods to wider markets.

Come to America's greatest industrial exposition. See what the revolution in production methods really means. Come to the Show!

Reduced railroad rates will apply for concurrent Machine Tool Congress — no advance in hotel rates. Interesting booklet on request—address 1220 Guarantee Title Bldg., Cleveland, O.

MACHINE TOOL SHOW

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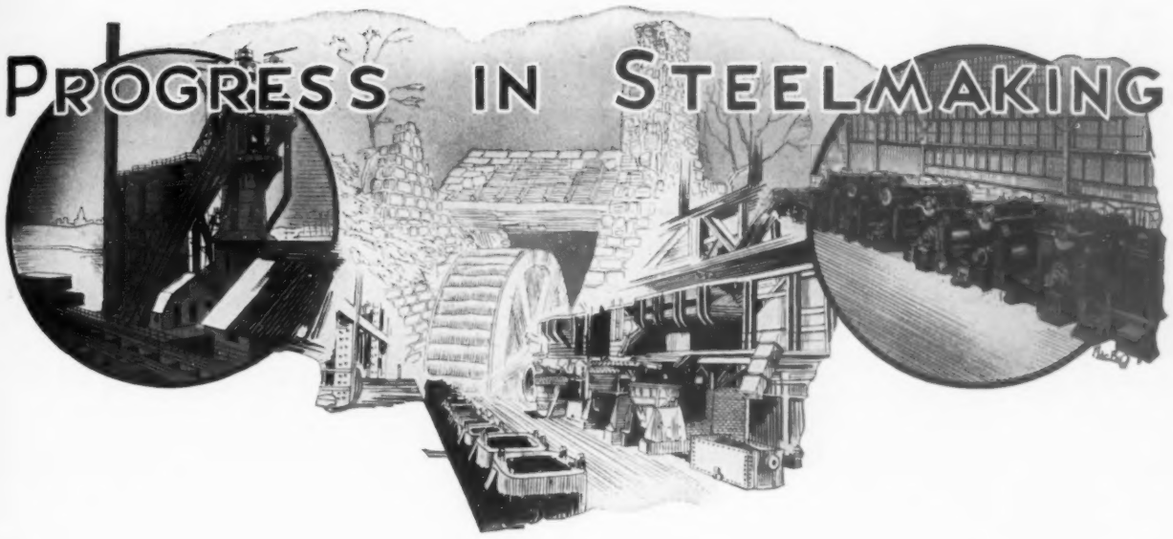
CLEVELAND

SEPTEMBER 11—21, 1935



New Paint Is Luminescent

Sulphur of calcium is the basis of a new luminescent paint recently developed to show the location of objects by night or in complete darkness. Sulphur of calcium, after a short exposure to artificial or natural light, slowly discharges a luminosity for a period of 12 to 15 hours; the luminescence of the surface again is restored by exposure to light. The product is highly suitable around blast furnaces and steel plants for gage dials, hydrants, stretcher cases, fire alarm boxes, electric switches, fire extinguishers, stairways, etc. The paint gives a permanent coating.

◆ ◆ ◆

Tracings Are Duplicated

Reproducing any number of tracings from the master tracing has been made possible by a new method. New or old tracings also can be reproduced satisfactorily either on tracing cloth or on paper as desired. Reproductions are nonsmearing and nonshrinking and can be made up to 54 inches wide and in any length. They may be used for reference thus permitting the original tracing to be filed away in a fireproof vault.

◆ ◆ ◆

Affords Prompt Treatment

To facilitate prompt and effective treatment of burns at steelworks, plants and factories, a special atomizer has been developed for applying tannic acid, a remedy for burns recognized by industrial medical authorities. The atomizer incorporates three features, namely, a wide mouthed bottle to facilitate filling, stirring and cleaning; acid and water levels clearly marked on the bottle to make correct mixing easy; and, a wide volume of soft spray giving quick application over a wide area.

◆ ◆ ◆

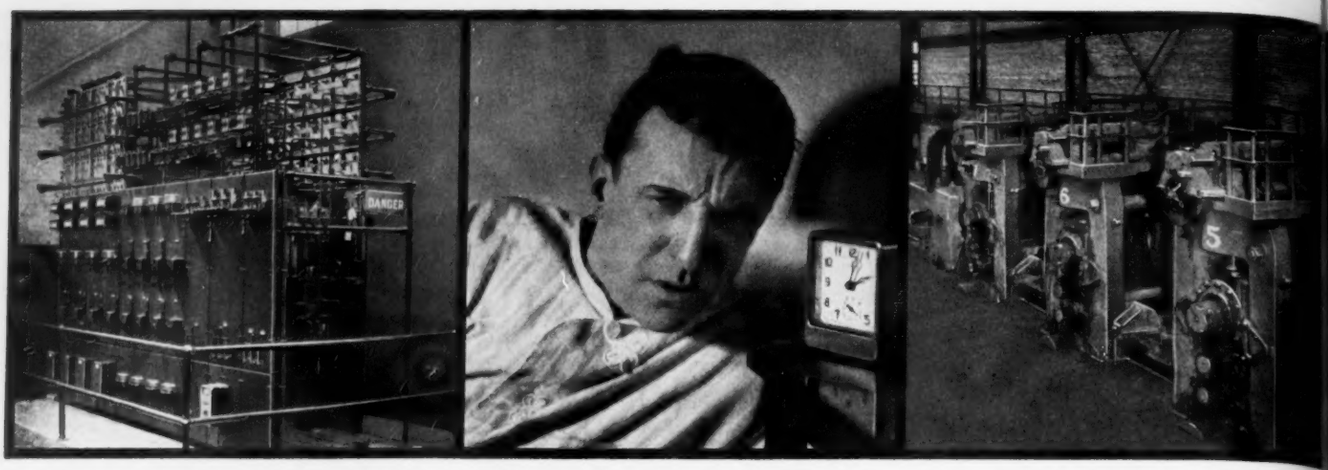
Simplifies Tuyere Repair

When copper tuyeres and bosh plates for blast furnaces are cast they frequently leak water when tested under pressure. This usually is remedied by forcing water glass into the casting and allowing it to set. When these parts are preheated for welding, and welded with copper rod they may not leak in the weld but the water glass employed to seal the porous spots is likely to burn out and cause the casting to leak at that particular location. One of the most satisfactory methods employed for repairing tuyeres is carbon-arc or torch brazing with no preheating. After the parts are cleaned off with hand tools or a grinder, powdered asbestos is sprinkled thickly around the hole to be closed by brazing. A trough is made in the asbestos, and a small

Heat Is No Longer a Problem

AIR CONDITIONING has been applied to the cabs of the 35 and 75-ton overhead traveling cranes at the plant of the A. M. Byers Co., Ambridge, Pa., for the convenience of operators. Refrigeration units of 1/3-ton capacity driven by 1/3-horsepower direct-current motors are installed on top of the cabs; the evaporators are mounted beneath the compressors. The cold air duct runs to the corner of the cab farthest from the operator; the return duct is mounted on the ceiling of the cab near the operators head. The sides and floor of the cab are insulated with 1⅛-inch material and a metal screen suspended in front of the cab window protects the operator from radiated heat

A Short Story for Steelmen



Once upon a time, through a mistaken sense of economy, an old switchboard was kept on the job after its long years of faithful service. It should have been rewarded with honorable retirement, but it wasn't. One night its old breaker failed, costing the super a night's sleep while he rounded up his crew and got them to the plant. For the damage done was more than the regular night gang could handle. . . .

. . . . because two jobs had to be done —the breaker had to be patched up by the electricians, and the cracked rolls that the stoppage of hot metal had caused, also had to be changed.

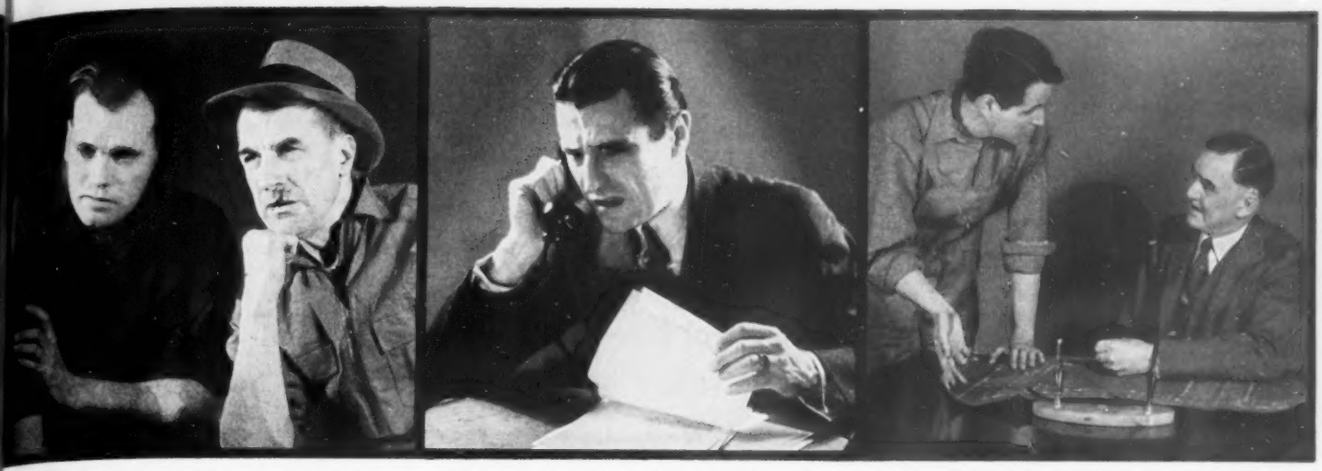
MORAL *Insure Your Production*

Extremely rapid "discriminating trip." On a short circuit, or rapidly increasing current, breaker trips immediately

Liberal silver-to-silver solid-block main contacts, with ability to withstand repeated pounding. This breaker can take it

GENERAL

about Using Obsolete Switchgear



Awaiting the completion of the repair work, a number of men got a rest—which didn't help production or cost per ton.

The net result of the delay was a late shipment to this customer—who had his own customers to think about—and to whom late shipments spelled loss.

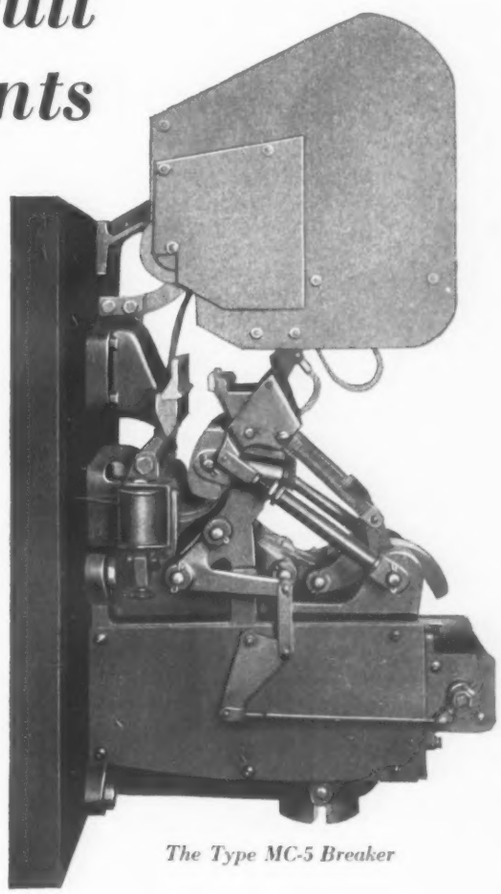
Naturally there was a post-mortem; but this time, trouble helped the electrical superintendent prove that his obsolete switchgear was penalizing production. Result—a decision to modernize.

with MC-5 Air Circuit Breaker Equipments

MC-5 equipments have been selected for two of the latest and largest hot-strip mills, for main-drive 600-volt d-c buses.

MC-5 equipments have been selected for five out of six of the most recent large steel-mill installations. These have the distinctive* G-E structural bus assembly for important 250-volt d-c mill auxiliary service. General Electric, Schenectady, N. Y.

*Buses and extended connections of massive structural shapes on extra-heavy porcelain insulators, all heavily reinforced for short-circuit stresses.



The Type MC-5 Breaker

820-13

E L E C T R I C

stream of water permitted to flow in the trough during the brazing process. A large welding tip as well as a large diameter bronze welding rod, such as 5/16 or ⅜-inch, has been found to be most satisfactory for this purpose. The hole is brazed quickly so the heat does not travel far into the copper casting. The same procedure is followed when the carbon arc is employed.

• • •

Produces Uniform Coating

Important requisites in the protective value of a zinc coating have been marshalled in a new method of galvanizing which is suitable for flat wire, shaped wire or steel strip.

The material to be coated is fed from the reels through an annealing furnace and after cooling slowly passes in sequence through a cleaning bath of hydrochloric acid, a fluxing solution, and a dryer before entering a bath of molten zinc. The viscosity of the zinc is governed by controlling its temperature. From the galvanizing pot the product passes through a mechanism which regulates the amount of coating to be carried and finally is subjected to the action of a controlled flame. This phase of the process evens the distribution of the coating around the product, smooths it, and seals all pores, pin holes and voids. The coated steel then is cooled and coiled. The process is being used by a midwest steelmaker for galvanizing fencing wire.

• • •

Makes Steel Free-Cutting

Addition of 0.04 per cent selenium to austenitic nickel-chrome steels imparts free cutting properties without detriment to their established characteristics. This element in the form of ferroselenium containing about 40 per cent selenium usually is added to the steel in the ladle to avoid oxidation losses.

Continuous Mill Built with Aligners To Overcome Roll Neck Deflection

CONTRACTS for bearings on the 26 and 53 x 80-inch continuous hot strip mill, which is being built by one of the largest steel producers in the midwest for location at Gary, Ind., have been awarded the Bantam Ball Bearing Co., South Bend, Ind.

The six 4-high finishing stands on this new mill are being built by Continental Roll & Steel Foundry Co., East Chicago, Ind., while the three 4-high stands of the roughing mill will be supplied by the United Engineering & Foundry Co., Pittsburgh. This new continuous hot strip mill will incorporate many features of advanced design.

Bearing Capacity High

Thirty-two Bantam 4-row tapered backing roll bearings, 29½ inches inside diameter x 46½ inches outside diameter x 30 inches long are required. These backing roll bearings will weigh approximately 4½ tons each and have a load capacity of 3,400,000 pounds at 100 revolutions per minute. This is believed to be the highest bearing capacity per unit of width on any existing hot strip mill, and is only approached in this respect by the 18 and 43 x 38-inch mill recently built by the Continental company. This mill is also 100 per cent Bantam bearing equipped.

In addition to the backing roll bearings, 32 Bantam taper roller bearings were specified for the work rolls. These bearings are 17 inches inside diameter x 22½ inches outside diameter x 11 inches long.

Bantam roller aligners will be installed in one stand of the roughing and one stand of the finishing mill. Provision has been made to install them on the remaining stands later on. This is a complete new development in the mounting of roll neck bearings and is designed to overcome the most serious cause of short bearing life, namely, roll neck deflection.

Due to neck deflection the rolling load is concentrated on the end of the bearing nearest the roll barrel. The Bantam roller aligner, however, affords complete compensation for this condition insuring that the bearing chock tilts to the same angle as the deflected roll neck. Thus the load is distributed equally throughout the length of the bearing instead of being concentrated on one end. This ability to utilize the entire length of the bearing increases bearing life.

The aligner consists of a large hardened and ground steel roller placed between hardened and ground flat steel plates transverse to the roll axis. When the neck deflects under the rolling load, the rollers move slightly outward permitting the chock to tilt to the same angle as the deflected neck. Measurements on mills equipped with the roller aligner show angles of deflection up to 0.012-inch per foot that completely are compensated for by the roller aligner.

In addition to the 80-inch continuous hot strip mill, Bantam bearings also were specified for the two temper pass mills, 20 and 48 x 84 inches which the E. W. Bliss Co., Brooklyn, N. Y., is building as part of the equipment in the expansion and modernization program of this steel producer. The backing roll bearings for these temper pass mills are 29½ x 44½ x 27 inches long of the taper type and those for the work rolls are $9\frac{1}{2} \times 14 \times \frac{6.000}{7.500}$ long of the straight roller type.

In addition to these mills the program also calls for a 4-high hot strip broadside mill 40 and 54 x 130 inches which requires eight Bantam 4-row tapered work roll bearings 28 and 36 x 12½ inches long. These bearings will have a capacity of 1,051,000 pounds at 100 revolutions per minute.

Hardened Steel Used

All rollers and races for the bearings will be made from SAE 52100 high-carbon chromium electric furnace through hardening steel produced by the Illinois Steel Co. Heat treatment will be accomplished by means of the special Bantam differential hardening method. In this process special means produce a hard surface and tough core with hardness gradually decreasing from surface to center. Also the special means produce an unusual toughness at highly stressed corners where brittleness ordinarily exists.

The special method described in the handling of rollers and races accounts for the unusual success of the company in overcoming the breakage which at times has been a serious factor in the success of antifriction bearings.

One-piece lubricating bronze cages will be used to retain the rollers, with accurately machined pads contacting the rollers at the pitch line, the weight of the cage being carried on the lands of the inner race.

Eliminating Order-Mistakes

"How Equipment Manufacturers Provide Against Inadequate Specifications in Customers' Orders" is the title of a survey report, copies of which may be had from the Policyholders service bureau, Metropolitan Life Insurance Co., 1 Madison avenue, New York. The report reveals that a number of manufacturers employ standardized methods of guarding against insufficient or misleading information on orders, and it outlines some of the methods in use.

NOW. . STABILIZE AUSTENITIC CHROMIUM-NICKEL STEEL with Ferrocolumbium

● Ferrocolumbium provides a convenient and economical means of adding columbium to chromium-nickel steels. Columbium stabilizes the austenitic chromium-nickel steels subjected to elevated temperatures so that susceptibility to intergranular corrosion is eliminated. Impact strength remains unimpaired. Subsequent intergranular attack by corrosives is avoided. Columbium-bearing 18-8 stainless steel can be used at temperatures between 1000 deg. F. and 1500 deg. F. without developing intergranular corrosion. The valuable properties of 18-8 stainless steel are retained.

Columbium does not burn out to a detrimental degree during welding by any method. Hence columbium-bearing 18-8 stainless steel can be used after welding with columbium-bearing welding rod without subsequent annealing. There is no increased susceptibility to intergranular attack in or adjacent to the weld seam.

Ferrocolumbium is a product of Electro Metallurgical Company. Our metallurgists will gladly further explain its uses and advantages. The booklet "Effects of Columbium in Chromium-Nickel Steels" will be sent you on request. Write for your copy today.

PRODUCTS OF A UNIT OF UCC UNION CARBIDE AND CARBON CORPORATION

CHROMIUM
High-Carbon Ferrochrome (maximum 6% carbon)
Low-Carbon Ferrochrome (in grades, maximum 0.06% to maximum 2.00% carbon)
Chromium Metal
Chromium-Copper
Miscellaneous Chromium Alloys

SILICON
Ferrosilicon 15% Ferrosilicon 50%
Ferrosilicon 75%
Ferrosilicon 80 to 85%
Ferrosilicon 90 to 95%
Refined Silicon (minimum 97% Silicon)
Calcium Silicon
Calcium-Aluminum-Silicon
Calcium-Manganese-Silicon
Silicon-Copper
Miscellaneous Silicon Alloys

BRIQUETS
(Patented).
Chrome Briquets Silicon Briquets
Manganese Briquets

COLUMBIUM

TUNGSTEN

MANGANESE
Standard Ferromanganese 78 to 82%
Low-Carbon Ferromanganese
Medium-Carbon Ferromanganese
Spiegeleisen
Manganese Metal
Manganese-Copper
Miscellaneous Manganese Alloys

SILICO-MANGANESE
All grades including Silico-Spiegel

VANADIUM
All Grades

ZIRCONIUM
35 to 40% Zirconium
12 to 15% Zirconium
Aluminum-Zirconium
Zirconium-Manganese-Silicon

ELECTRO METALLURGICAL COMPANY
Unit of Union Carbide and Carbon Corporation
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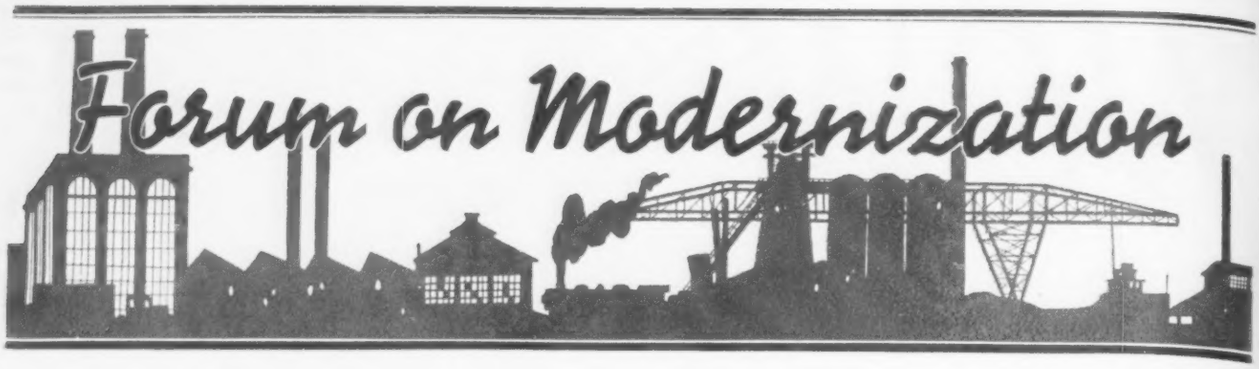
CARBIDE and CARBON BUILDING
30 EAST 42nd STREET • NEW YORK, N.Y.

Electromet
Ferro-Alloys & Metals



Modern Welding Machines Show Pronounced Savings in Operation

BY J. F. LINCOLN
President, Lincoln Electric Co., Cleveland

MANY users of arc welding would be money ahead if they sold for scrap the old type welding machines they are now using and purchased new equipment. Old welding sets are actually costing users enough more than new machines to pay entirely for new welders in a few months' time. Every hour an obsolete arc welder is operated, it wastes at least 30 per cent of the operator's time, 14 per cent of the electrodes used and 10 per cent of the power consumed. In other words, the obsolete generator actually wastes about 25 cents out of every dollar spent on welding. And yet there are thousands of these out-of-date machines in operation today.

Provide Higher Capacity

In the first place the new welders have 60 per cent higher capacity than machines built only a few year ago. They are rated at 40 volts instead of the usual 25 volts. This increased capacity permits the new machine to weld much faster than old machines. This is mainly due to the fact that the higher capacity allows the use of larger size electrodes. Going to one size larger electrode frequently saves up to 20 per cent on welding costs.

But it takes something more than high capacity to get these savings. The welding machines must deliver a current not only of proper capacity but of uniform characteristics, otherwise the additional electrode metal which the increased heat of the higher current melts would be lost in splatter and waste. Uniform current is what the new welders have and what the old machines lack. With the new welder and its uniform current more of the electrode metal goes into the weld. Thus, money spent on electrodes goes much further.

Welding Efficiency Increased

In addition to their higher capacity and uniform current, modern arc welders generate more usable welding current per kilowatt input than old machines. At full loads their efficiency is 10 per cent greater. It becomes still greater on overloads. This means *more welding per kilowatt hour*—more welding for the money spent for power.

Lumping the net reseult of all these advantages together, the effect on welding costs is amazing. Any number of instances could be cited to show that a new welder has saved a company its entire cost in only a few months. Then having paid for itself, it goes right on putting those same monthly savings into the user's pocketbook.

One point should be made clear in reference to this comparison of obsolete and modern welding generators. Tremendous strides have been made in the development of welders in the last three years. Therefore, an obsolete machine is not one that it ten or even five years old. It may be less than three years old—yet it is obsolete, costly and inefficient compared with the 1935 product.

Savings made by the new welders are amazing. In a chemical plant which recently scrapped obsolete welders in favor of 1935 models, welding time was reduced 29 per cent, floor-to-floor time 25 per cent. On one job, time was cut from 6 manhours to 4½ manhours. At the same time, 14 per cent less electrode was used and power costs dropped 10 per cent. Even as small an item as a new electrode holder reduced time for changing electrodes 20 per cent.

Similar savings were noted by a fabricating plant when obsolete machines were discarded in favor of modern arc welders. Total cost saving varied from 15 per cent up to 25 per cent, depending on the type of work. On special jobs, savings amounted to 35 per cent over former figures. These savings, translated into dollars and cents, mean actual cash savings of $3 per day, enough to pay for a new welder in a year.

In maintenance work, the better performance of the new welder cuts costs. One plant reports the following savings made in one week on repair jobs: $27.75 by arc welding a broken tooth in the gear of a drop hammer; $31.50 on repairs to a bending machine; $27.96 by repairing a broken punch press ram; $13.90 by welding a broken sanding machine; $13.04 by restoring edges of two drill press tables.

Added to these repair savings, this plant states that it builds all sorts of new equipment such as special frames, tanks, trucks, shelves, tool racks, structural work and piping and reduced the cost of jigs and fixtures 60 per cent.

Slashes Tool Costs

Another plant, in the metalworking field, has been enabled to save as much as 35 per cent on tool costs by using new arc welders in refacing worn tools of reamers, dies, milling machines, shapers, planers and the like. This plant also uses arc welding to make many tools from low-cost steel at 1/10 to 1/20 the cost of tool steel. Tools so made have been shown to last two to three times longer than expensive tools.

Considering the maintenance savings which can be made it becomes evident that a new welder will soon pay for itself. Even with savings of $3 per job the new welding machine should save its entire cost in a year, or by the most conservative estimate in 18 months.

But the new user as well as the

old user will get most savings out of arc welding only with a modern welding machine. He must have the uniform current, high capacity and increased efficiency which today's arc welders provide. Then, and then only then, will arc welding yield its greatest profits.

Progressive Manufacturer Needs New Tools To Maintain Position

BY HUGO L. OLSON
President and General Manager,
Sundstrand Machine Tool Co., Rockford, Ill.

CAN a representative and progressive metalworking establishment *afford not* to buy machine tools of the latest design?

The general answer to the question above is "No." Let any representative metalworking establishment refrain *long enough* from buying machine tools of the latest design and that establishment will first cease to be progressive, next cease to be even representative, eventually cease to exist. There may be exceptions to any general statements but it is submitted that the apparent exceptions will eventually come under the general statement.

The Case of Mr. X

For example, consider a condition which came to my attention some years ago. A representative and progressive metalworker, Mr. X, required a new machine tool. The machine tool builder who received the order built an improved machine that increased production while maintaining the necessary high standards of accuracy. Mr. X asked the machine tool builder not to offer machines of this type to any of his competitors. The new machines had already been offered to all of Mr. X's competitors, including Mr. Y in the same town!

Mr. X was highly agitated until he learned that Mr. Y had taken a machine tool representative into the department where this particular work was done, pointed out that his equipment was in reasonably good shape and amply able during regular working hours to produce all of the work then coming into the plant. Mr. Y had to have a certain number of men to run the department anyway, consequently purchase of one of the new machines immediately would not effect any reduction in his payroll, would involve a substantial investment of capital and throwing out one or more machine tools in good running order. Soon as volume of business increased, or equipment already installed required extensive overhauling, Mr. Y would be delighted to consider the purchase of one of the new machines but until then he was not in the market.

Meantime, Mr. X had nothing to fear. He could go ahead and run his new machine to capacity, apply the savings which it effected against its purchase price, build up a reserve against obsolescence, pocket the additional profits thereafter or pass on some of the savings to his customers. In the latter event his competitors, including Mr. Y, would have to buy machine tools equal to Mr. X's or else lose business to him. By the time this condition developed, however, the machine tool builders would probably have other new and better tools for Mr. X's competitors to buy, and eventually Mr. X also would have to buy new equipment to keep up with the procession. In other words, Mr. X could afford to buy new equipment, Mr. Y could—for a *limited time*—afford not to buy it, but would have to do so eventually.

It is not so much a question of whether metalworking establishments can or cannot afford to buy machine tools of latest design but rather a question of *how long they can refrain from buying.*

When Is Time To Buy?

When orders are coming in rapidly, plants are working overtime, profits are piling up; the purchase of new machine tools represents an opportunity for still greater profits. The heavy pressure for greater production seeks out the weak spots in the machine tool equipment, breakdowns interfere with the smooth progress of work through the plant, late deliveries threaten loss of business. Under these conditions it is evident that the metalworking plant cannot afford to wait a minute before buying machine tools of the latest design.

During periods when volume of orders about equals plant capacity in normal working hours is the time when purchase of new machine tool equipment is not a matter of wiring for immediate shipment. Rather, this is the time to consider carefully what is available, what advantages are to be secured by purchasing new machine tools, to add to reserves against obsolescence which ought to be established during peak periods, to buy new equipment that will provide increased net profits on the existing volume of business.

When the volume of incoming orders is less than the capacity of the plant to produce during normal working hours is a time when the natural tendency is to tighten the purse strings, to refrain from any expenditure which cannot show immediate return. Let this policy be pursued too far or too long and the question becomes, "How much longer can we remain in business?" As a matter of fact, doesn't a slack period present an opportunity for the representative and progressive metalworking concern to take account of stock, to put the house in order, to search out ways and means of improving products and manufacturing methods, and rehabilitating shop equipment?

Make Money By Spending

The representative and progressive metalworking establishment is working continually to improve its own products, the general idea being to increase sales. Sometimes the improvements eliminate machining operations, which may throw some perfectly good machine tools out of a job temporarily. Increased sales, as a result of the product improvement, often result in putting such machine tools back to work on other operations. This may involve slight alterations in the machine tools or the provision of new tooling equipment for them. Can the progressive manufacturer *afford not* to have these alterations made, or to purchase the required new tooling? Before certain improvements can be made in some products it is necessary to purchase new machine tools to carry out new manufacturing processes. Will the progressive manufacturer abstain from making desirable improvements in his product because he cannot afford to buy the necessary new machine tool equipment? Hardly, because "He who would make money must begin by spending."

To buy or not to buy? To answer this question correctly the prospective machine tool purchaser must have accurate and complete knowledge of what the market affords, or what the machine tool builders can make to meet his special requirements. He ought to read business papers regularly, including editorial articles, new tool descriptions and advertisements. He ought to regard every piece of direct mail material

(*Please turn to Page* 52)

INDUSTRIAL PROSPECTORS

Bigger Savings Better Profits

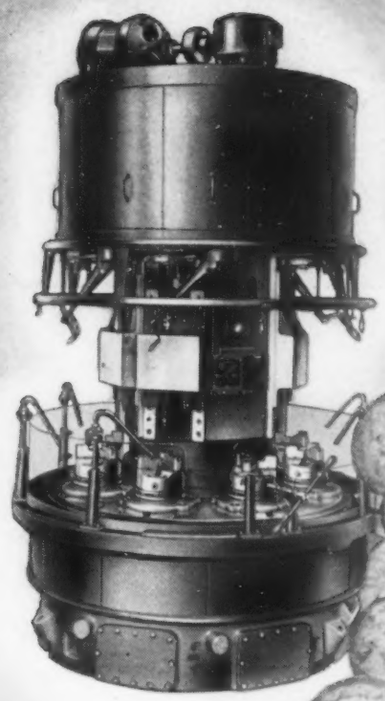
As the Prospectors of Old sought for Gold and Better methods of obtaining it, so—

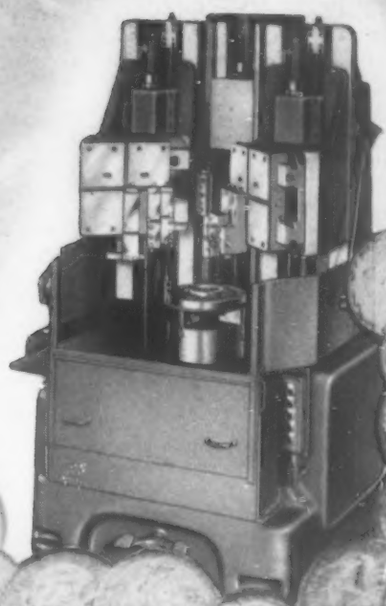
Today's Industrial Prospectors are seeking out their jobs which afford an opportunity for Bigger Savings. At the same time it is essential to select the Best method for Turning these jobs into Better Profits.

Bullard Type "D" Mult-Au-Matic for those heavier jobs—Type "J" Small Mult-Au-Matic for the small high-speed work—and Single Spindle Vertical Automatic Lathe present the solution to many problems and afford a means for Profitable manufacturing.

THE BULLARD COMPANY

"THERE'S GOLD IN THEM THAR JOBS"





From Machines

into Tills and Coffers of Business

Nearly every job affords a potential saving in its manufacturing cost. Industrial Prospectors who equip to take advantage of all possible savings are finding "The Gold in Them Thar Jobs," and are also filling the Tills and Coffers of their Business.

It pays to prospect. Let Bullard Engineering Service assist in your search for this flow of Profits. Let Bullard Engineers Estimate your Jobs and Turn them into Increased Profits.

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IMPROVING OPEN-HEARTH FURNACE DESIGN

by William C. Buell Jr.

Chapter V — Part I

Connecting Flues

CONNECTING flues are the short units that connect the regenerator outlets with the flue system proper. As the connection of the fantails to the regenerator chamber entrance, developing the critical areas A_{11}, governs the requirement of regenerator chamber height above the checkers, so the emergence of the connecting flues at the regenerator chamber outlets and in which the critical areas A_{13} are formed in a major degree govern the dimensions to be maintained under the checkers and which must be established prior to an improved design of regenerator chambers. The regenerator outlets are relatively wide and low, while the flues are developed to considerable narrowness and height.

The design of the connecting flues is of considerable importance to fluid flow conditions within the checkers. If symmetrically developed to include areas that will produce appropriate fluid velocities it will be evident the distribution of the gaseous fluids at the under side of the checkerwork may be better than if the design is nonsymmetrical or the fluid flow of high velocity. Either condition is prone to cause turbulence or stratification and maldistribution of the fluids.

Areas $A_{12}A$ (air), $A_{12}G$ (gas) or A_{12}

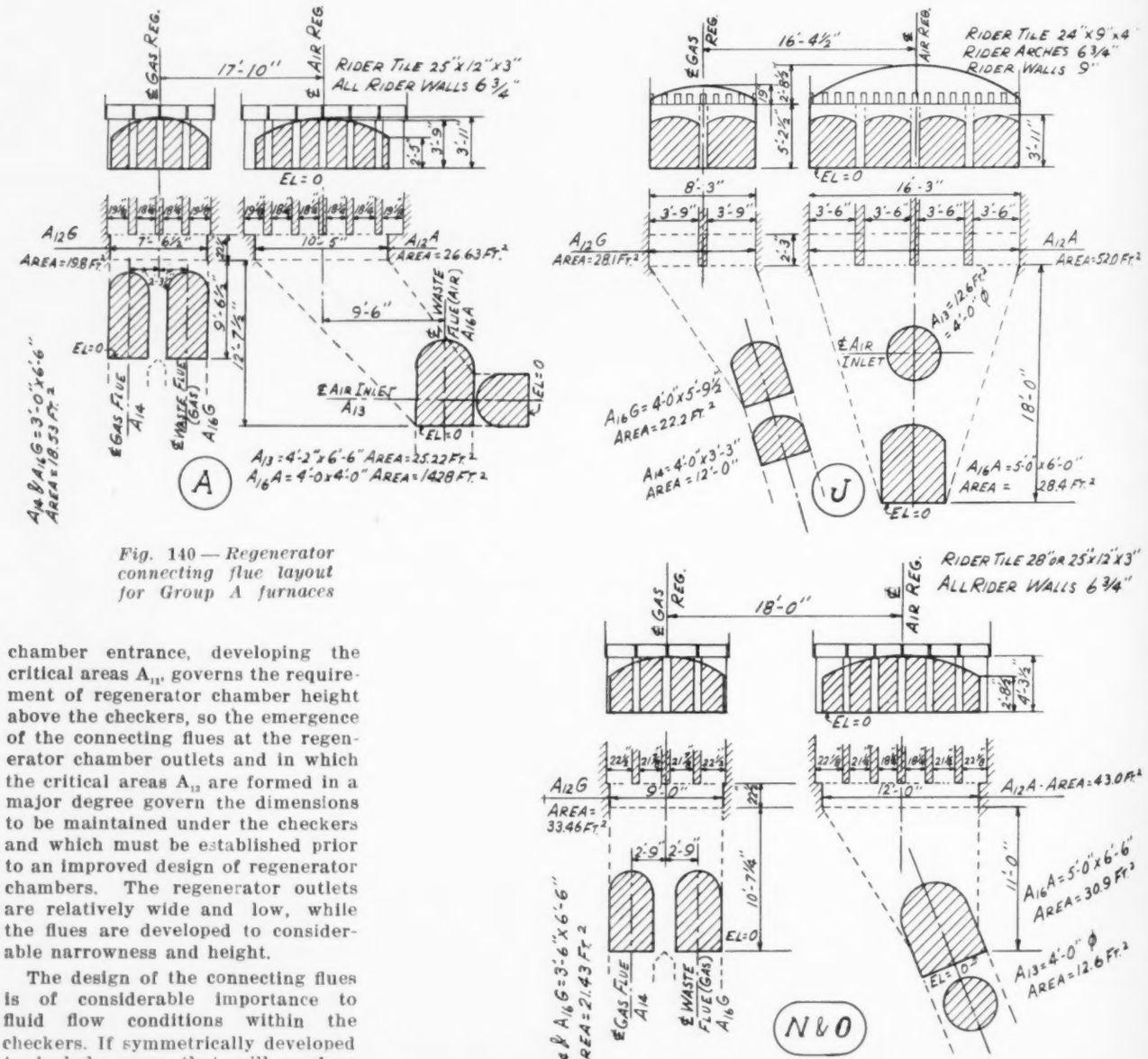

Fig. 140 — Regenerator connecting flue layout for Group A furnaces

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.....greater resistance to corrosion

.....lighter construction with equal strength.....or.....

.....increased strength with greater life

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Available in sheets, strip, plates, bars, shapes, wire, and seamless pipe.

YOLOY is an intermediate alloy steel for special problems. It is exactly fitted to hundreds of new requirements of modern design.

YOLOY means longer life where severe corrosive and abrasive conditions are encountered. YOLOY applications in marine, rail, motor transportation, structural or machinery construction afford advantages of strength, weight-saving and added performance.

Higher tensile strength combined with high ductility makes it possible to build stronger yet lighter construction at only a slight increase in cost over ordinary carbon steels. Detailed bulletins gladly furnished on request.

YOLOY TRADE MARK YOUNGSTOWN STEEL

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon and Alloy Steels

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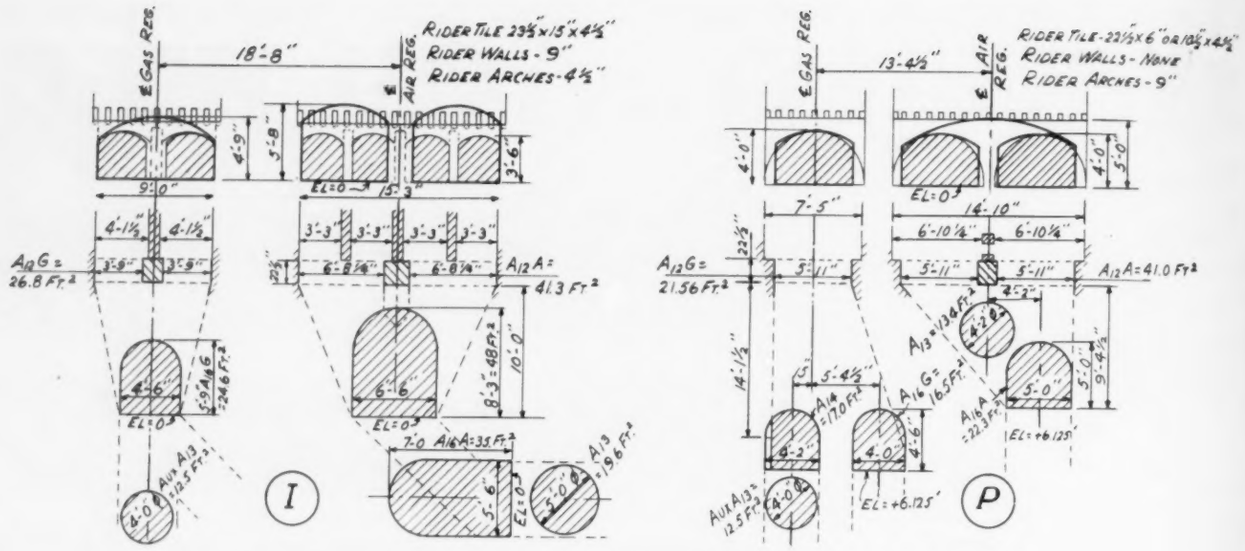


Fig. 141—Layout of regenerator connecting flues for Group B furnaces

as the sum of both are the free areas available for the unrestricted flow of incoming or outgoing fluids at the bottom of the back wall of the regenerator chambers. The free areas will be modified by the design of the apertures through the back walls and the arrangement of the rider system.

The minimum ideal areas are premised on a relative velocity of 12 feet per second for producer and mixed gas firing and 9 feet per second for all other fuel types. Lesser velocities are desirable but are particularly difficult to secure in producer gas operation on account of mechanical limitations in design.

The relative velocity values previously mentioned are the same as recommended at the regenerator chamber inlets, A_{11}. However, the actual areas necessary to secure similar velocities at A_{11} and A_{12} will be materially smaller in the latter case as a result of volume shrinkage from cooling.

Temperatures Are Assumed

The temperature of the influent gases at A_{11} was assumed as 2850 degrees Fahr., K = 2.594, for all types of fuel firing. The arbitrary temperature conditions of the effluent furnace gases assumed for design purposes as at A_{12} are: producer gas operation, 1250 degrees Fahr., K = 1.86; mixed gas operation, 1000 degrees Fahr., K = 1.70; and fixed fuel practice, 1100 degrees Fahr., K = 1.78. If similar relative velocities are maintained the area will vary from temperature difference in a ratio of the coefficient S, K.

Low velocity both in and out of the regenerators is a great aid to better distribution of the fluids to or from the checkers. After leaving the regenerators there is no particular advantage to be gained from a minimum velocity but there are some advantages in a higher velocity. Consequently, after leaving the regenerator chambers at A_{12} the areas are decreased to the stack end of the connecting flues where the normal or a slightly greater flue area is developed at A_{16}. The areas A_{16} should be developed to produce relative velocities of about 20 feet per second at temperatures which will be about 50 degrees Fahr. lower than the temperatures at A_{12}.

With the foregoing in mind it will be well to examine the connecting flue system of the typical furnaces in order to find to what extent designers have shown an appreciation of the fundamentals involved, and have applied them. The arrangements of these furnaces are shown, Figs. 140

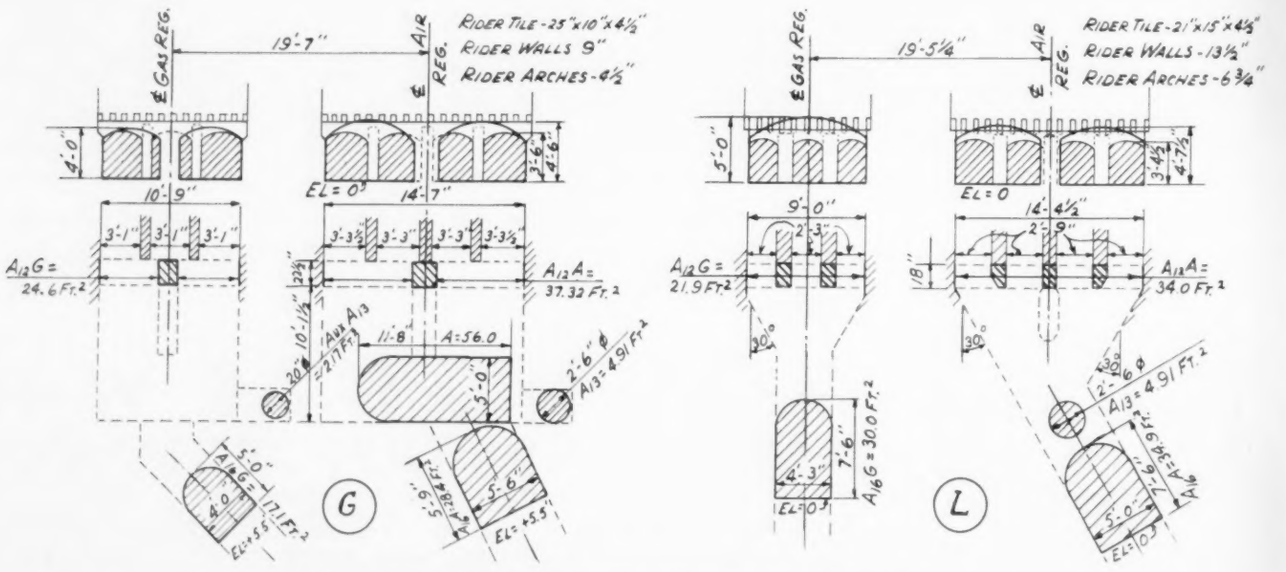
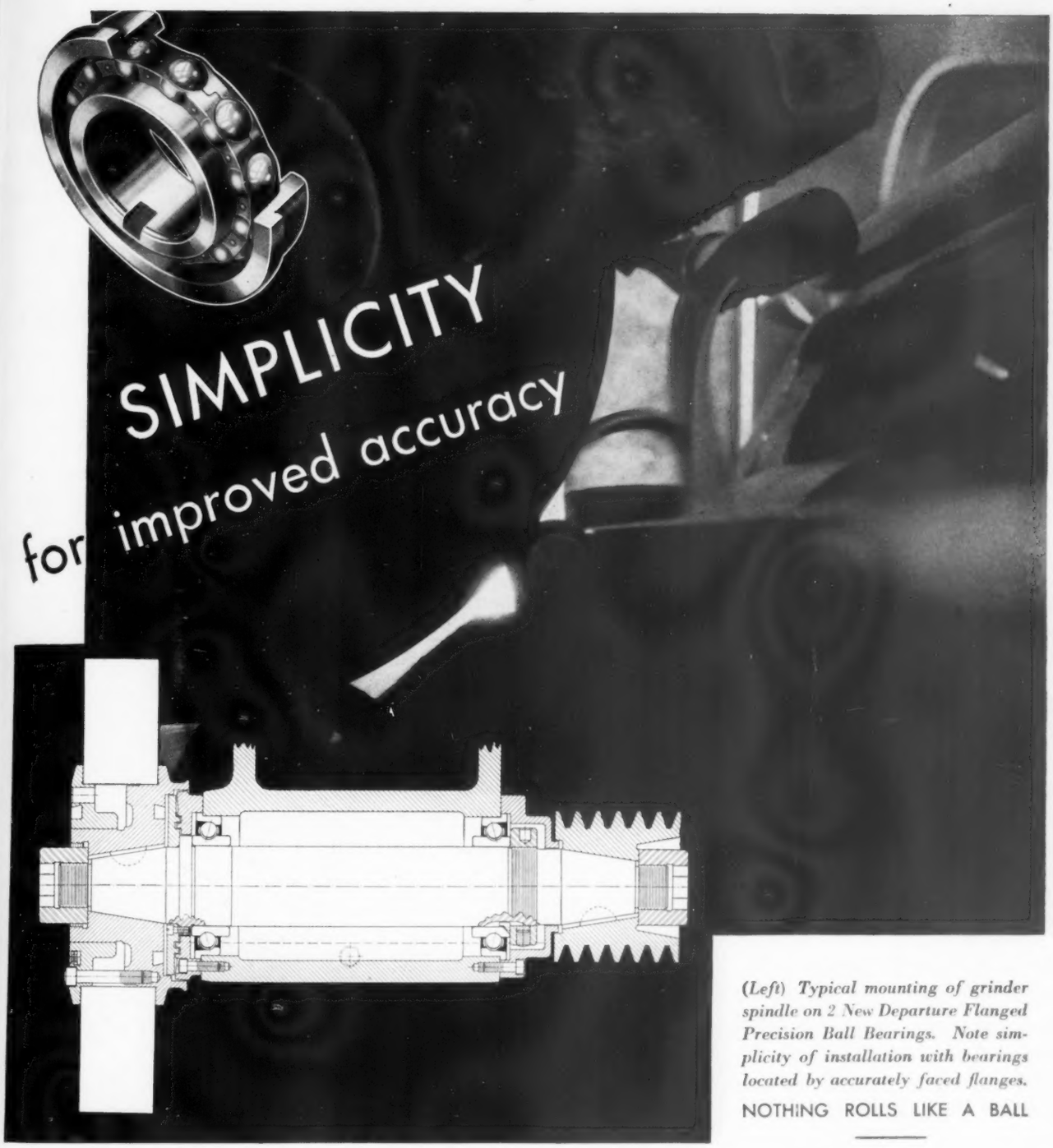


Fig. 142—Layout of regenerator connecting flues for Group C furnaces



(Left) Typical mounting of grinder spindle on 2 New Departure Flanged Precision Ball Bearings. Note simplicity of installation with bearings located by accurately faced flanges.

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Simplified Mounting — Shoulders on the bearings instead of in the housing enable you to bore two bearing seats *straight through* at one set-up. Result: A saving in expense and perfect alignment of the bearings assured.

For Precision Workmanship — These precision spindle bearings are so designed that when applied under a moderate preload, extreme resistance to deflection under grinding loads is obtained.

With this combination of accurately aligned housings and ultra-precision bearings you get a cool, easy-running, yet very rigid mounting that needs no further adjustment and will assure maximum freedom from vibration or chatter.

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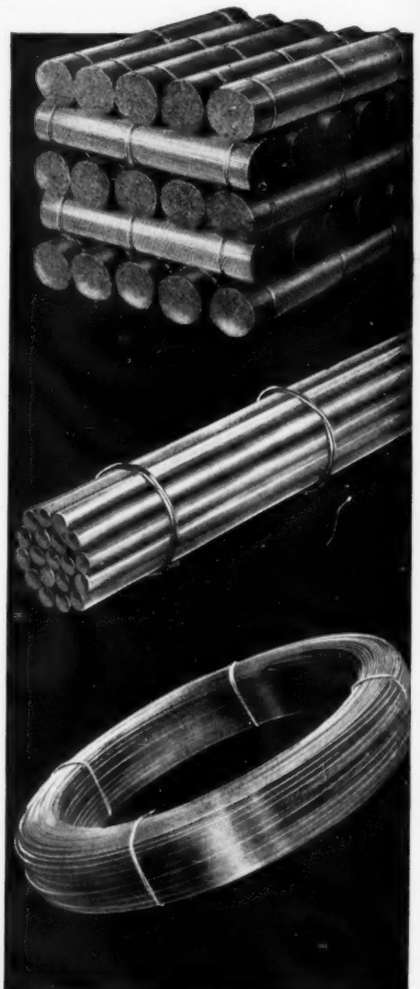
● Conforming to our policy of developing materials to meet the specific needs of manufacturers, Continental has developed "KONIK"—a new metal that is arousing tremendous interest. KONIK metal (patented) is a high grade basic open hearth special analysis steel, containing copper, nickel and chromium. It is readily workable and possesses unusual properties for case hardening. KONIK steel takes a deeper case than straight carbon steel and is amenable to heat treatment for strength, resistance to abrasion and many other purposes. KONIK steel resists atmospheric corrosion far better than ordinary steel, although it is not a stainless steel. KONIK steel is supplied in rods and wire. Our metallurgists will be glad to consult with you regarding your special needs.

ADAPTABILITY—KONIK steel possesses superior qualities for a great variety of uses, because of its unusual fabricating qualities.

CASE HARDENING—KONIK steel takes a deeper case, and responds more readily than do the straight carbon steels, to either solid, liquid, or gaseous case-hardening mediums.

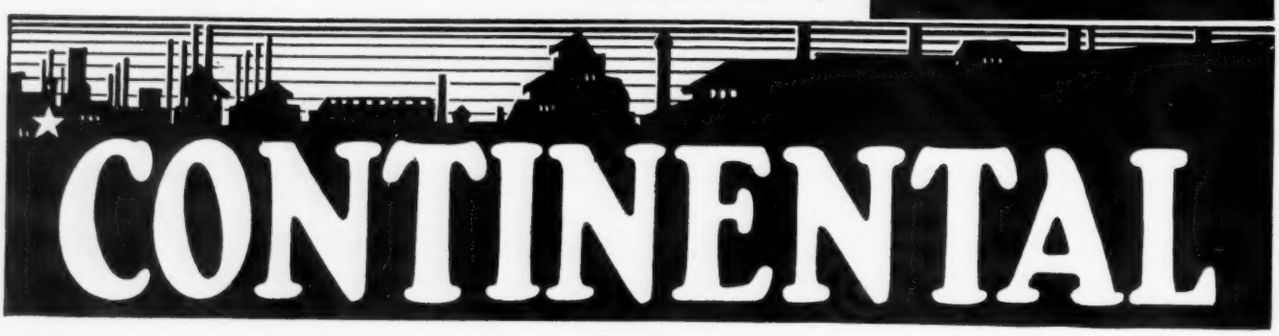
WORKABILITY—KONIK steel is tough, ductile, and strong. It withstands severe deformation and can be formed, drawn, stamped, or spun. It may be brazed, soldered, or welded.



CONTINENTAL STEEL CORP., General Office: KOKOMO, INDIANA

Plants: Kokomo and Indianapolis, Indiana, and Canton, Ohio.

*TRADE MARK REG. U. S. PAT. OFF.



to 143, inclusive. Although these illustrations are diagrammatic, the principal governing dimensions are given.

The upper elevational view shows the outlet of the gas regenerator at the left, and that of the air regenerator at the right. Both are bounded by a line representing the inner surface of the regenerator brickwork at the sides and bottoms. The rider walls are shown spanned by rider tile or rider arches. In the arrangement the rider tile are shown on top of the rider arches. Superimposed are the inner outlines of the connecting flues which may extend through a regenerator backwall or originate at the backwall. The lightly cross-hatched areas show the extent of the free area or that which is calculated as $A_{12}G$ (gas) or $A_{12}A$ (air).

At the bottom is a layout plan, delineating the arrangement of the rider walls, the openings through the backwalls of the regenerators with dotted lines indicating the plan development of the connecting flues. Scale elevations of the minimum connecting flue areas at $A_{11}G$ or $A_{10}A$ are given, as are those of the gas flue A_{11} and the air inlet A_{12} where such are immediately adjacent to the connecting flues.

The design of furnace A indicates to what extent a poor rider wall arrangement will curtail area and prove responsible for faulty distribution. Examining this diagram in plan it will be evident that the areas A_{12} will be those as developed on the line of the rider tile ends and the inner backwall surface of the regenerators. The area of the opening through the backwall is about 35 feet square but from this must be deducted the area of the rider tile that shield the opening and which reduce the free area at $A_{12}A$ to about 26.6 feet square.

Flow Is Restricted

Visual examination of the upper view of the air regenerator entrance will show clearly that there will be only a partial flow possible in the two outside rider channels as a result of the restricted entrance and which will materially reduce the effectiveness of about one-third of the checkerwork volume. Having the same type of rider system the foregoing comments will be found as also applying to the connecting flues, furnaces N, O, D and E, with an appropriate measure of design criticism.

Furnace J offers a design in which the rider arches are in effect carried straight through the backwall without any loss of area. This is a superior design when the height necessary in the roof of the connecting flue is nearly 8 feet in this case can be taken.

A design similar to that of furnace J is found in furnaces K, B and E, and in a slightly modified form in L. At the air side of L, two narrower roofs of lesser height are substituted at the regenerator end for the single roof span of the others. Area is lost and distribution impaired in furnaces I and G, particularly the latter by the introduction of the heavy center pier in both the gas and air units.

The design disclosed in furnace H warrants especially favorable comment. The rider walls are discontinued short of the regenerator backwall so that before reaching area A_{12} the gases enter a clear chamber of a larger area than either that under the rider arches or through A_{12}, the result being that the full developed areas of A_{12} are entirely effective. By visual inspection it is evident that were the rider walls extended to the

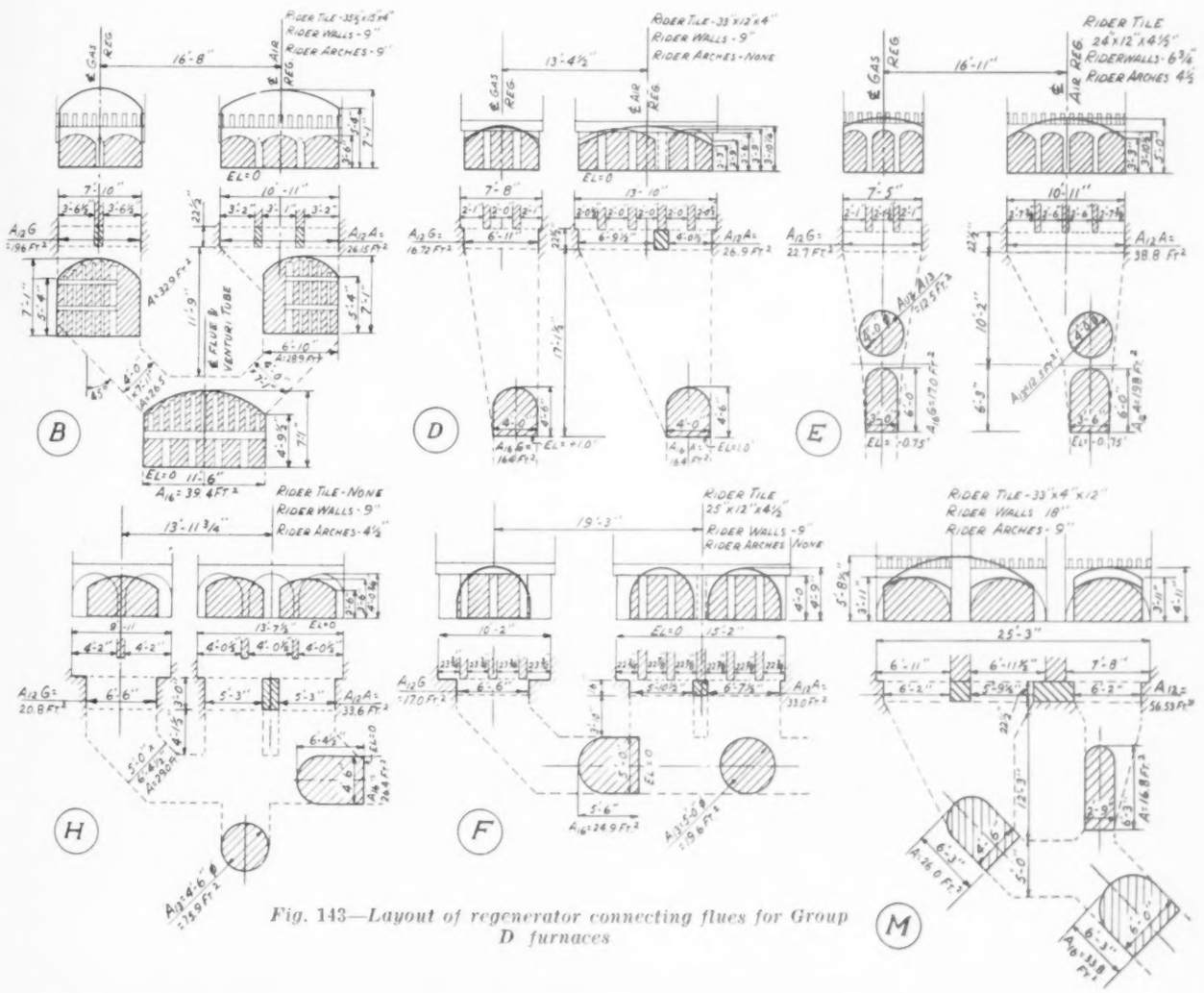


Fig. 143—Layout of regenerator connecting flues for Group D furnaces

regenerator backwall, as is usually the case, the areas through the backwall would be curtailed severely and with interference of distribution would result.

Of the furnaces with transverse rider walls, P and M, the areas A_{12} are well developed in the case of the former and poorly in the case of the latter.

The limitations of layout that so severely affect the design of the fantails are generally absent at the connecting flues which usually are symmetrically arranged. However, it would appear that a somewhat better design could be arranged for furnaces A, P and G.

The entire flue system is crowded in depth, furnaces H and F, and consequently symmetrically developed connecting flues are absent. While the designs designated likely were forced by building or other limitations the operation of the regenerators would be much benefited were these layouts improved so that the draft would tend to draw to or from the center of the areas A_{12} and thus afford good distribution rather than towards a side as actually will be the case.

Two approved arrangements of the connecting flues are offered in Fig. 144. The design A relates specifically to the proposed 150-ton producer gas fired furnace and B to the fixed fuel arrangement but obviously with appropriate modification of detailed dimensions the arrangements are interadaptable.

In the A design the areas under the rider arches are gas, 19.6 feet square each, total 39.2 square feet, and air, 15.5 feet square, each or 62.0 feet square, total. The area at $A_{12}G$ is 39.4 feet square and at $A_{12}A$ 62.3 feet square. The height of areas A_{12} is 5 feet 6 inches. The widths of the areas A_{12} are 2 feet less than those of the regenerator chambers which is desirable because it simplifies the design of the steel binding.

How Effectiveness Is Secured

The effectiveness of areas A_{12} is secured by stopping the rider walls short of the backwall so as to develop a plenum of greater area than those found under the rider arches at A_{12}.

With the B design the rider walls and arches are in effect extended through the regenerator backwalls and, consequently, the areas A_{12} are the sum of the area of the rider flues.

With this arrangement and in order to secure unabridged areas it is necessary to locate the skews of connecting flues at the same height as the skews of the rider flues. This causes the connecting flue roof to develop to considerable height, 7 feet 7½ inches, as shown, and which dimension would be greater with the 1 foot wider producer gas furnace air regenerator chamber. In addition the width of the connecting flues must be the same as those of the regenerator chambers. This may cause difficulty in the binding design.

The author prefers the A design as being the most satisfactory from all points of view.

All of the pertinent data regarding fluid volumes, areas and velocities through the regenerator chamber inlets at A_{11} and the outlets at A_{12}, excepting that of fantail and connecting flue angularity, are assembled in Table CXVIII for easy comparison.

The appropriate data anent the 150-ton producer gas fired furnace, the design of which has been developed and carried throughout these works, is included following the typical group A furnaces, and that of the fixed fuel furnace following the typical group D furnaces.

The fluid flow values, columns a to d, excepting those for the proposed furnaces, which were subsequently developed, are as in Table LIX, (STEEL, May 22, 1933.) The apportionment of the furnace gas volumes to the air and gas regenerators, columns a and c, are in the ratio of areas A_3, (A_7, furnace L) to A_5, Table LIII (STEEL, April 17, 1933). The areas and velocities through the regenerator inlets, columns e and f, are carried forward from Table CI and the minimum area necessary to develop

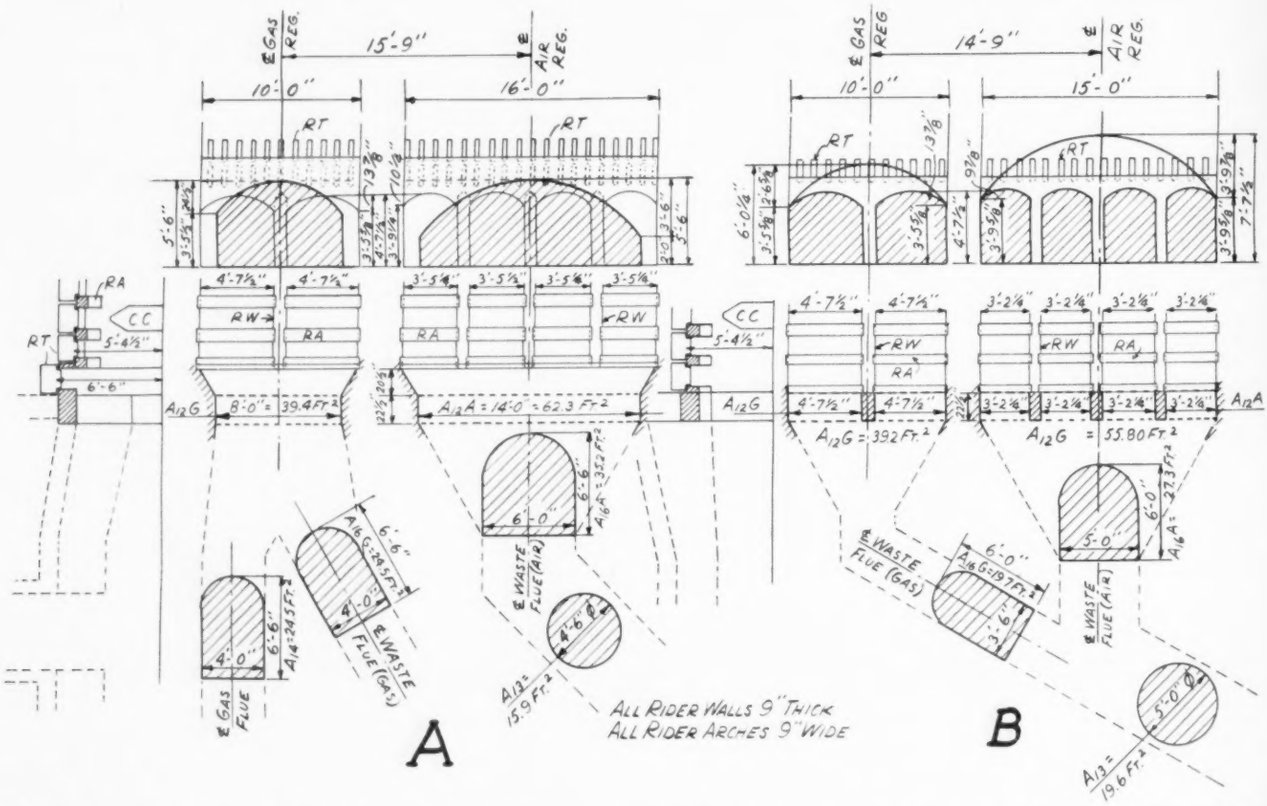


Fig. 144—Approved lines of connecting flues for 150-ton open hearth producer gas fired furnace (A) and fixed fuel fired furnace (B)

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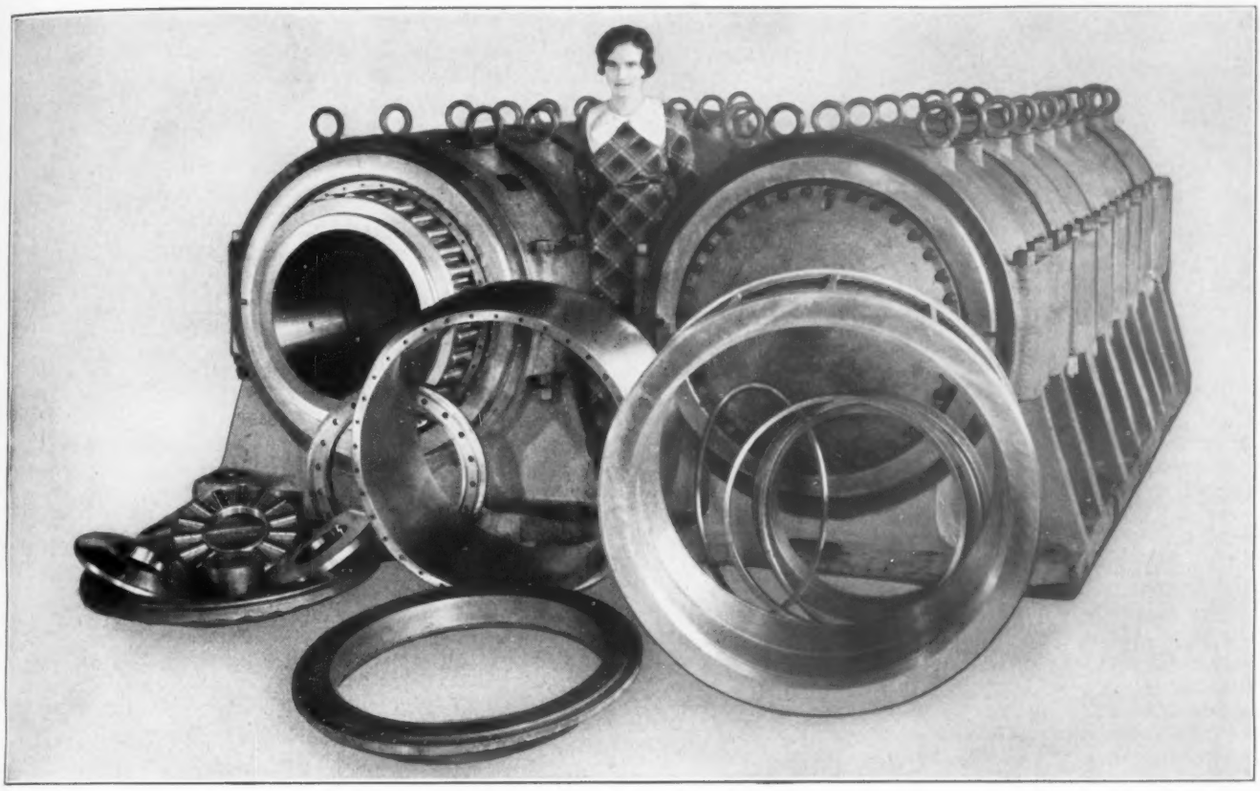

Sixteen Bantam Roller Bearing Pillow Blocks 22″ I.D. by 52½″ high with a base 5 ft. long support the 8 main sheaves 16 feet in diameter by 31″ wide which lift the moveable span of the new Cape Cod Canal railway bridge.

The moveable span is 130 ft. long, weighs 4,160,000 pounds and is the largest of its type in the world.

Bantam Roller Bearing Pillow Blocks were selected for this service on the basis of their outstanding performance record on heavy duty service throughout industry.

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ONE OR A HUNDRED MILLION • 1/32″ TO 60″

Table CXVIII

Fluid Distribution, Velocities Thorough Critical Areas at Regenerators and Areas to Develop Maximum Ideal Velocities

	Fluid Flow Through				Conditions at A_{11} or $A_{11}A$			Designated Critical Areas					
	Air System		Gas System					A_{12} or $A_{12}A$			A_{16} or $A_{66}A$		
	Furnace		Furnace	Fuel	Present design		Ideal min.	Present design		Ideal min.	Present design		Ideal min.
Furnace	gas, ft.³/sec.	Air, ft.³/sec.	gas, ft.³/sec.	gas, ft.³/sec.	Area, ft.²	Velocity, ft./sec.	area, ft.²	area, ft.²	velocity, ft./sec.	area, ft.²	area, ft.²	velocity, ft./sec.	area, ft.²
	a	b	c	d	e	f	g	h	i	j	k	l	m
Group A													
A	350	232	93	211	43.8	20.7	75.5	26.6	24.5	54.3	25.2	25.6	32.2
J	360	201	24	183	74.8	12.5	77.9	52.0	12.9	55.8	28.4	23.3	33.1
K	364	212	40	193	47.2	20.0	78.7						
N	446	280	89	255	38.1	30.4	96.5	43.0	19.2	69.1	30.9	26.6	39.9
O	503	310	80	278	38.1	34.5	109.5	43.0	21.8	79.0	30.9	29.9	46.2
Proposed	367	210	33	190	**84.6**	11.2	79.3	**62.3**	10.9	57.8	**35.2**	19.2	33.8
Group B													
I	199	179	99	90*	52.6	9.8	57.3	**41.3**	8.6	39.4	**35.0**	10.0	17.5
P	206	186	47	42*	**75.6**	7.1	59.2	**41.0**	9.0	40.6	**22.3**	16.2	18.0
Group C													
G	207	145	82	55*	39.6	13.6	44.9	**37.3**	9.5	29.3	**28.4**	12.3	17.5
L	234	235	107	108	48.1	12.6	50.5	**34.0**	11.7	33.2	**34.9**	11.4	19.8
Group D													
B	192	173	.....	.....	**71.2**	7.0	55.6	**39.4**	8.7	38.0	**39.4**	8.5	16.9
D	180	162	.....	.....	**53.6**	8.6	51.9	**46.7**	6.9	35.6	**32.8**	9.6	15.6
E	229	206	.....	.....	54.6	10.9	66.1	**61.5**	6.6	45.3	**35.8**	11.2	20.0
H	210	189	.....	.....	**65.7**	8.3	60.6	**54.4**	6.9	41.5	**26.4**	13.9	18.4
F	220	187	.....	.....	**77.8**	7.4	63.5	**50.0**	7.8	43.5	**24.9**	15.5	19.2
M	247	222	.....	.....	67.5	9.5	71.3	**56.5**	7.8	48.8	**33.8**	12.8	21.6
Proposed	265	238	.....	.....	**101.4**	6.8	76.5	**95.0**	5.0	52.4	**47.0**	9.9	23.3

*Air as operated.

the most satisfactory velocity condition, column g, have been calculated as with the furnace gases having the relative velocities of 12 feet per second for producer and preheated mixed gas firing, furnace L, and 9 feet per second for all other fuels.

The figures anent areas A_{12} and A_{16} are developed from the data of the present chapter, the ideal flow values through A_{12}, column j, being calculated on the same basis as previously mentioned for A_{11} and those through A_{16}, column m, as 20 feet per second relative velocity entering the flues.

The values of area, which equal or exceed those calculated as the minimum necessary to most satisfactory operating conditions, are shown in bold faced type.

Designs Are Unsatisfactory

Among the group A furnaces none of the typical furnaces show satisfactory designs. With the exception of furnace J, the design of which approaches the ideal established, all furnaces show definite evidence of subnormal design. Inasmuch as flow conditions through these critical areas of the proposed furnace are entirely satisfactory it is evident suitable designs may be achieved.

The conditions of flow in and out of the regenerators of all typical furnaces other than the producer gas group are uniformly satisfactory. This probably is not due to a higher order of design, but rather to the fact that all furnaces, excepting G, L and F were design initially to use producer gas. Later when fired with fixed fuels, both the gas and air sides of the regenerators became available for preheating the combustion air with a more equal distribution of the furnace gases to both systems, the combining of all areas, and the material decrease in the fluid volumes to produce an equivalent heat release. These factors tended to lower the fluid velocities to the satisfactory conditions found in all but a few instances.

With group A, B and C furnaces, flow conditions are shown as applying to the air side of the system only. Because of receiving the substantially greater portion of the furnace gas, the air side is always the most severely crowded even after giving effect to the lesser areas of the gas side of the system.

For the group D furnaces the values are taken as combining both sides of the system as $A_{11}\ G + G_{11}\ A = A_{12}$.

As before mentioned, the angularity of the development of the connecting flues should be as little and as symmetrical as conditions will allow.

In most cases it will be possible to converge the sides from the regenerators to the flues at an angle that is not greater than 60 degrees. Every effort should be put forth to accomplish this result.

(*To be continued*)

Correction

In Table CXII on page 61 of the Aug. 5 issue, the temperature of the hotter surface, t_1, in footnote No. 1, should have been assumed as 2400 degrees Fahr. instead of 244 degrees.

Forum on Modernization

(*Concluded from Page* 41)

coming to him from a machine tool manufacturer as an opportunity to learn something advantageous, something that may help him solve a difficult problem, cut costs or otherwise increase net profits. He ought to visit machine tool plants, taking with him complete data on manufacturing operations that are presenting difficulty or in which he may think some improvement can be made.

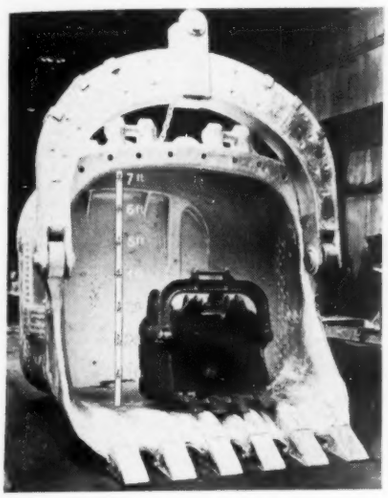
While the last suggestion is a desirable procedure, it is not always practical. Consequently the Machine Tool Show to be held in Cleveland Sept. 11-21 represents an unparalleled opportunity for a large number of executives, connected with progressive metalworking establishments to become acquainted quickly and easily with the enormous progress in machine tool building, and many new pieces of equipment which have been created.

A malleable company recently insulated an annealing oven, which resulted in a saving of 29 per cent in fuel consumption, or a total of $308 a year.

NEW EQUIPMENT

Composite Type Power Shovel Dippers—

American Manganese Steel Co., Chicago Heights, Ill., is introducing composite type power shovel dippers of unusally light weight. This development has been accomplished by proper designing and employment of aluminum alloy and high tensile



Amsco composite type dipper employs aluminum alloy

rolled steel for parts not subjected to the heaviest abrasion. Illustrated is a 15-cubic yard composite dipper recently shipped to Commercial Fuel Co. for use on its Marion 5320 shovel in stripping coal. It replaces a 12-yard solid dipper.

This composite dipper weighs 32,940 pounds as compared with 74,000 pounds, the weight of a 15-yard all-manganese steel dipper made several years ago. Dippers of this composite design have a top casting of manganese steel, of complete double wall construction, with integral bases and bail connections. The bottom casting, likewise of manganese steel, is also double walled at the back where the dipper stick is connected.

Front plates are high-tensile rolled steel welded with spacers to form a double wall between top and bottom castings. The back plate is of rolled aluminum alloy while the back braces connecting top and bottom castings are cast aluminum alloy. It is not pretended that these composite dippers will stand the same abuse that an all-manganese steel dipper of the same capacity can undergo, but for medium work where a plate or cast-steel dipper affords sufficient structural strength, the composite dipper will show great economy by reason of the impact and wear resistance of the exposed manganese steel parts.

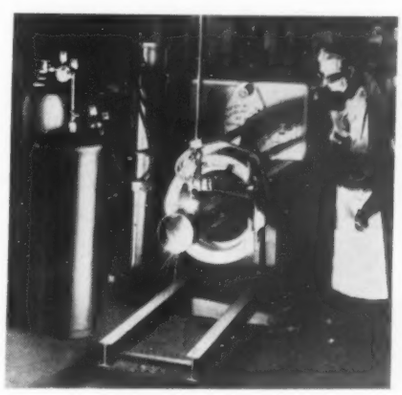
• • •

Machine For Cutting Pipe Intersections—

Oster-Williams, 2057 East Sixty-first place, Cleveland, has developed a machine for cutting pipe intersections which performs automatically a task that heretofore only could be done by skilled hand labor. The cutting torch is guided accurately by an ingenious mechanism that duplicates the motion of a torch held in the operator's hand. It will cut any size of pipe from 2½ to 12 inches, making full size tees or reducing tees 90 degrees, branch reducing tees 45 degrees to 90 degrees, elbow, miters, Y's and blunt bull plugs, as well as hole cutting.

The machine, shown herewith, is somewhat similar in appearance to a radial drill press. The generating case which is made of aluminum is mounted on a rotating column which can be swung in any direction and readily positioned to the end or side of the pipe for the various cuts. The pipe is placed on ball bearing rollers, housed in adjustable supports resting on double rails mounted on the welded steel base of the machine.

If the end of the pipe is to be cut off for butt or tee welding, then the pipe is placed through the aluminum torch carrier ring. If a hole is to be cut in the side of the pipe, the torch carrier ring is swung around until it faces the side of the pipe. No templates are needed for the cut, nor does the job have to be laid out. A chart is furnished which guides the operator for any kind of a job he desires; then he sets the machine and it is ready to make the cut. For even the most difficult cut, it is only necessary to make five simple settings.

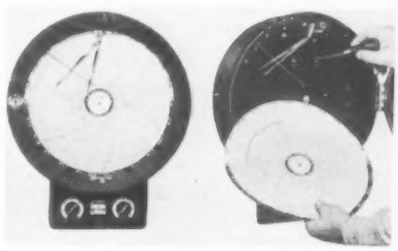


Oster-Williams machine for cutting pipe intersections

• • •

Air-Operated Controllers—

Brown Instrument Co., Philadelphia, announces a complete line of recording and indicating air-operated controllers for temperature, flow, pressure and liquid level. Radically new is the simplicity of the means provided in the "Air-o-Line" for "tuning in" the controller to the specific process characteristics without interruption to automatic control. Throttling range and automatic reset dials are instantly adjustable with a screw driver, without removing the chart plate. Indicating and recording thermometer-type temperature controllers are available for temperatures within limits of −40 degrees Fahr. and +1200 degrees Fahr. Potentiometer-type controllers are available for temperatures within limits of −300 degrees Fahr. and +3400 degrees Fahr.

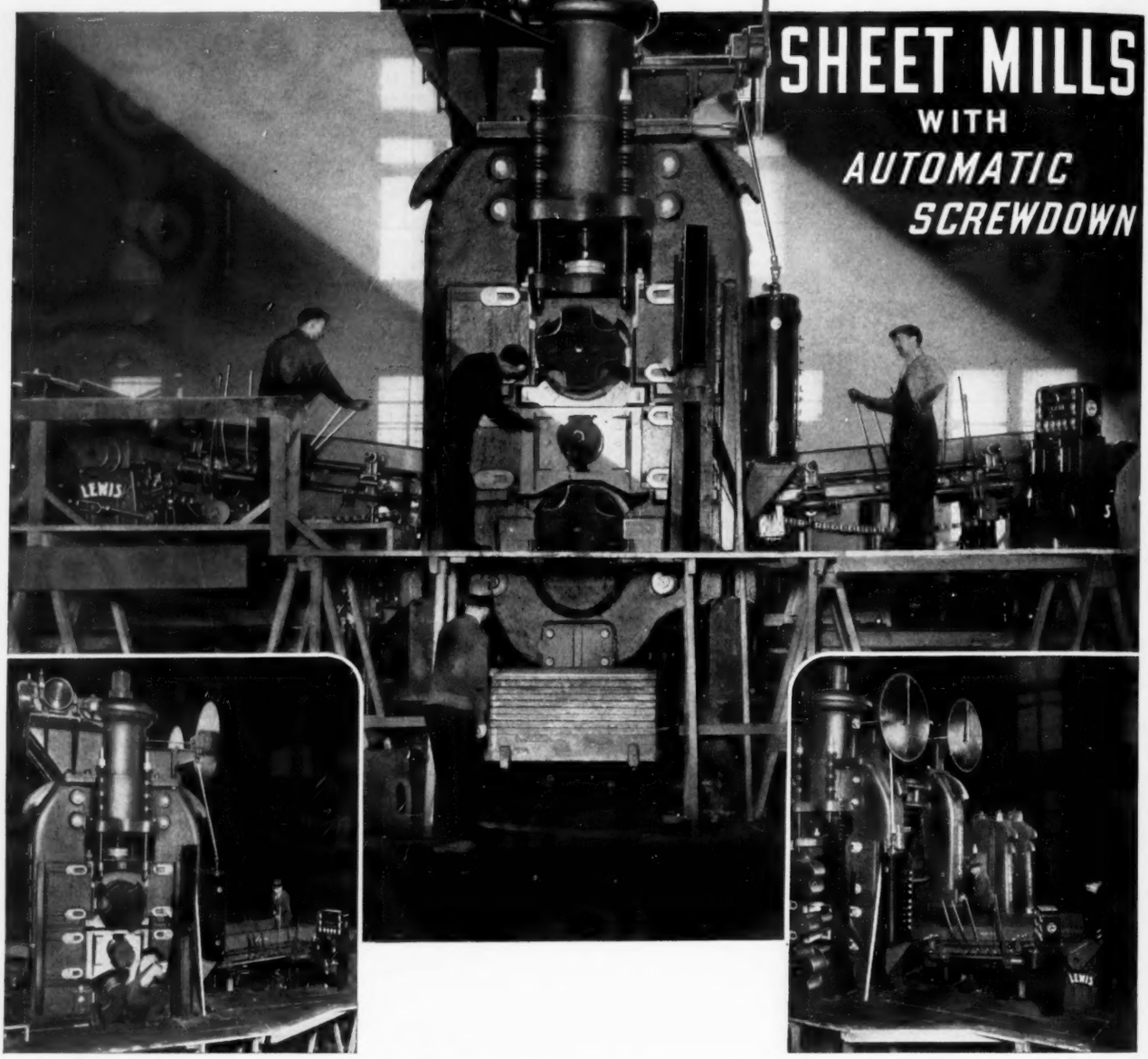


Brown recording and indicating air-operated controller

Two types of flow controllers and liquid level controllers are also offered; the inductance bridge type and the mechanical type. Thus, for the first time, the remote operating characteristics of the electric flow meter and the flexibility of air operated control are combined in one

LEWIS 3 HIGH

SHEET MILLS WITH *AUTOMATIC SCREWDOWN*



Here is illustrated a LEWIS Three High Sheet Mill with automatic screwdown, completely erected for a very thorough shop test before shipment.

LEWIS Three High Sheet Mills are featured for—

- Automatic screwdown when specified.
- Accuracy.
- Simplicity.
- Independent control of screwdown and feeder and catcher tables.
- Increased production.
- Long life.
- Increased tonnage from rolls.
- Better finish of finished work.

The Three High Tables are roller bearing equipped throughout. All gears and moving parts are wholly enclosed and run in oil.

An engineer will gladly call and show you the many detailed advantages of Lewis Three High Sheet Mill Equipment.

LEWIS FOUNDRY & MACHINE CO.
PITTSBURGH, PA.

controller. Indicating and recording pressure controllers are available in ranges from 30 inches vacuum to 3000 pounds per square inch pressure.

In addition to the "Air-o-Line", three other types of air-operated controllers are included in the new line. These are, the "Full Throttler", a controller with 1 to 150 per cent throttling range and manual reset; the "Throttler", a controller with 1 to 10 per cent throttling range and manual reset; and the "On-Off Controller", a controller for two-position service.

• • •

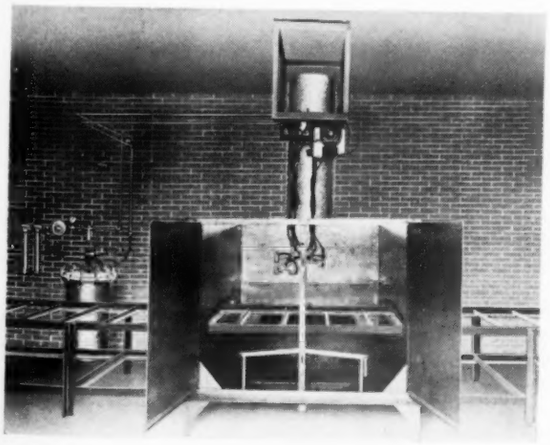
Spray Coating Machine and Down-Draft Spray Booth—

DeVilbiss Co., Toledo, O., recently announced a swinging arm spray coating machine and down-draft spray booth, an unusual adaptation of spray painting equipment to the continuous process of production. As its name indicates, the machine operates on the principle of an arm, with spray gun mounted on lower end, which swings back and forth over the product to be sprayed. It can be likened to the movement of an operator's arm except that the machine consists of two arms which move in opposite directions.

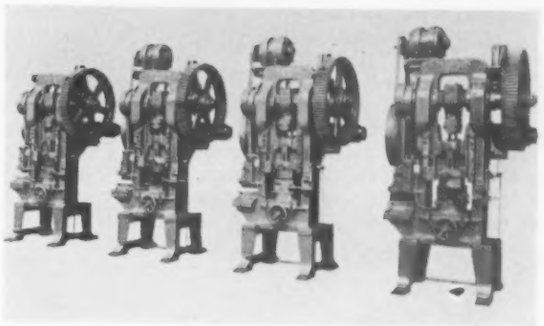
The unit has been designed for production spray coating of flat products up to four feet in width, such as sheet metal, glass, tile, fabrics, floor coverings, wall board, paper, etc. The machine applies a smooth even finish at a speed of from ten to forty lineal feet per minute, depending upon the type of surface, kind of finish desired, kind of finishing material used, and speed of conveyor.

The down-draft spray booth was designed especially for use with a conveyor in connection with the swinging arm machine. Made of galvanized iron, it is composed of four sides and a bottom. The conveyor and the work it carries is admitted to the booth through openings on opposite sides.

Bottom of booth is flat, usually about twelve inches from floor of room. The exhaust duct, at bottom of booth, is at right angles to the conveyor. It is composed of a removable top and adjustable side openings so set as to create an even distribution of exhaust.



DEVILBISS swinging arm spray coating machine in typical installation which also shows down-draft spray booth, conveyor, pressure feed paint tank, air and fluid piping, regulators, gages and valves

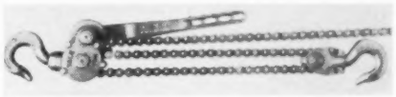


FOUR 9 F trimming presses built by Cleveland Punch & Shear Works Co. These units which are arranged with V-belt motor drive, operate at 65 strokes per minute

• • •

Load Handling Device—

Yale & Towne Mfg. Co., Philadelphia, recently introduced a new load handling device which may be used in either the horizontal or vertical position. Used horizontally, it may be employed to pull machines into position, move materials, etc. Vertically, it is a hoist which lifts all types of loads up to the capacity of the particular lifting unit. The unit, shown herewith, is compact and portable. Moving parts are completely enclosed so that they may be operated in grease and protected from injury.



Yale & Towne load handling device for horizontal or vertical use

• • •

Trimming Presses—

Cleveland Punch & Shear Works Co., Cleveland, recently brought out a 9 F trimming press which, as shown in the accompanying illustration, can be furnished in a wide range of sizes and capacities and with various types of drive. These units operate at 65 strokes a minute and are used for upsetting test pieces. The pieces first are cut to the proper length on the side shear which has full hole shear blades and adjustable back gages. After being cut, the pieces then are set on end under the inner slide and are securely held in a upright position by means of a magnet block which readily can be adjusted for various sizes of test pieces by the use of a handwheel. This handwheel located conveniently at the front of the press, adjusts the magnet back to the proper height, the adjustment being so designed that each notch on the dial of the magnet registers one thousandth of an inch.

A positive lock also is provided to hold the adjustment securely when it is once set. The slide is arranged to take care of major adjustments. Entire attachment is boxed in and is equipped with a safety door so that the press positively cannot be operated until the door is closed. The clutch also has a non-repeat attachment, thus providing double safety for the operator.

• • •

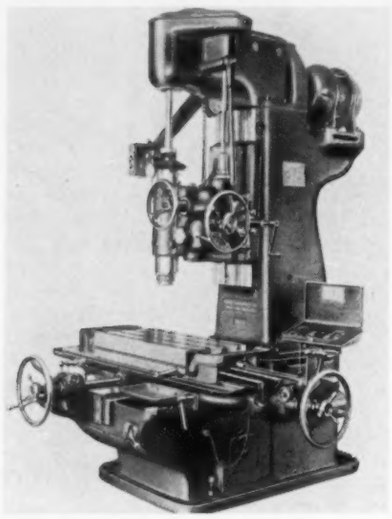
Jig Borer—

Pratt & Whitney Co., Hartford, Conn., has introduced a new model jig borer designated No. 2A. The new machine, shown on page 56, embodies many features which have speeded up production. These include 12 spindle speeds ranging from 37 to up to 1800 revolutions per minute; 8 spindle feeds in either direction ranging from 0.0005 to 0.010 inch for each spindle speed; "shockless" insulated motor and spindle drive; hardened, ground and lapped spindle quill; spindle mounted in permanently sealed ball bearings; depth dial indicator; direct reading ten-thousandth dial indicators built into each table slide; built-in electric lights; all tool changes made in the spindle nose; three point adjustable bearing on the floor for quick and accurate leveling.

The new unit is available in two sizes, known as the No. 2430 and No. 3644 respectively. The two machines

differ only in table sizes and work range, but are otherwise identical. The No. 2430 machine has a table working surface 16 x 30 inches, and longitudinal and transverse table travels of 24 and 18 inches respectively. The maximum and minimum distances from the table top to the spindle end are 24 and 2½ inches.

The No. 3644 machine has a table working surface 22 x 44 inches, and



Many new features are embodied in No. 2A Pratt & Whitney jig borer

longitudinal and transverse table travels of 36 and 18 inches, respectively. The maximum and minimum distances from the table top to the spindle end are 27½ and 6 inches.

Both sizes have a spindle head travel on the face in the column of 12½ inches, and a spindle quill travel of 9 inches, with the spindle quill graduated in 16ths. The distance from the spindle center to the guide on the column face is 17½ inches.

The open side construction of the jig borer is a distinct advantage because it greatly increases what otherwise would be a restricted work range. It permits the operator to reach his work very easily and follow his progress with full vision.

♦ ♦ ♦

Spray Painting Machine—

Binks Mfg. Co., 3114 Carroll avenue, Chicago, has brought out a new unit for rapid spray painting of the outside of kegs, drums, barrels and similar metal and wood cylindrical containers. The product to be sprayed is fed on to the revolving mechanism by gravity through an adjustable opening in the rear of the spray booth. The barrel then rests on the revolving sheeves. These sheeves are adjustable for all standard sizes of barrels.

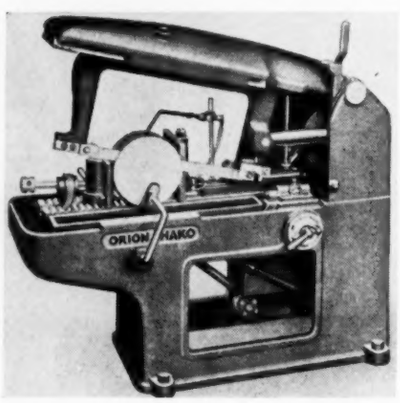
The sheeves are revolved by a totally enclosed motor connected by a V-belt to a reduction gear. The speed can be adjusted for the various barrel diameters. An operator with a model No. 2 gun sprays the finishing material on the barrel as it revolves. Immediately upon finishing a barrel the operator pulls the lever on the mechanism which rolls the barrel onto a conveyor.

♦ ♦ ♦

Hydraulically Controlled Power Hacksaw—

Marburg Bros. Inc., 90 West street, New York, recently introduced a new hydraulically controlled power hacksaw, features of which include high and constant production and uniformly straight cutting, in addition to long life of the individual saw blade. The unit is shown herewith.

Entire sawing operation consists of an automatic cycle and requires no supervision, particularly no "helping along" during the start and the finish of a cycle. After the saw is started, the bow is lowered automatically and the sawing takes place at first with a minimum of pressure, until a groove has been cut. The pressure then builds up rapidly to a few hundred pounds during the larger part of the stroke, while at the beginning and the end of each stroke the pressure is reduced to zero. To-



Marburg Bros. Inc. markets hydraulically controlled power hacksaw

ward the end of the sawing cycle, the pressure decreases to almost zero, the saw stopped automatically when the cut is completed, and the bow returned automatically to the starting position.

Pressure desired is set at the start by means of a lever. The saw works smoothly and firmly, since the bow is rigidly guided by two large gibs on either side of the bow.

♦ ♦ ♦

Rotary Magnetic Chuck—

O. S. Walker Co. Inc., Worcester, Mass., recently developed a rotary magnetic chuck, shown herewith, for

Sixty-six-inch rotary magnetic chuck built by O. S. Walker Co. Inc.

use on a special boring mill type grinding machine built by Niles Tool Works, Hamilton, O., for Timken Roller Bearing Co., Canton, O. The unit is 66 inches in diameter, weighs about 5500 pounds, and requires 2300 watts for its operation. A steel forging is used for the body which is recessed to receive the six coils. The two outside coils are wound on insulated steel spools to facilitate handling and also to secure maximum core section.

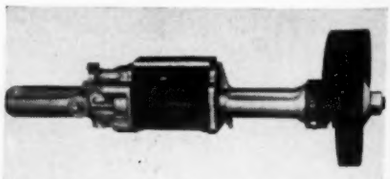
Top plate is the radial pole type, made from steel castings and owing to the weight of the chuck this top plate is attached to the body by screws, these being protected by brass closing screws threaded into the counterbored holes above the body screw heads. A wide variety of auxiliary rings are used with this chuck, and a series of drilled and tapped holes in the chuck face is provided for the screws holding these rings in place. Lead wires from the coils terminate in a pair of collector rings located in the 7½-inch diameter hole at the center of the chuck.

A bronze cover plate shown in the chuck center can be removed giving access to the brushes and electrical connections. In the foreground of the accompanying illustration is shown a standard 6-inch chuck for comparison; also the brush unit employed in this installation.

♦ ♦ ♦

Six-Inch Grinder—

Rotor Air Tool Co., 5704 Carnegie avenue, Cleveland, recently added to its line of air tools a new type D-0-2 6-inch grinder, shown herewith. Weight is 9 pounds. This tool has a twin rotor type of motor to give a smooth flow of power, free from vi-



D-O-2 6-inch Rotor Air Tool grinder has four-part governor

THE EVENT OF THE YEAR

in the Metal Industry!

EACH YEAR the leaders in the metal industry assemble in the Fall to attend the National Metal Congress and Exposition.

This year they will be in Chicago on September 30 when this great Show opens in the New International Amphitheatre.

In the course of more than forty technical and practical sessions they will bring news of the latest developments in the world of metals. More than seventy-five papers dealing with all the phases of production, selection, fabrication, inspection, treatment, welding and application of all kinds of metals, will be presented.

Be on hand to hear and join in the discussion of these valuable papers. It is your opportunity of the year to exchange ideas with the leaders in your industry.

In addition to these technical and practical sessions, there will be hundreds of exhibits, many of them in actual operation, where you will have opportunity to see and study the newest advances in materials, methods and equipment.

Without question, this is the most important annual event in the world of metals. You will get hundreds of new ideas at the technical sessions, at the exhibits, and from association with the leaders of your industry. Headquarters will be at The Palmer House. Make your reservations now directly to the hotel and plan to attend

THE NATIONAL METAL CONGRESS AND EXPOSITION

in the New International Amphitheatre, Chicago

SEPTEMBER 30, OCTOBER 1, 2, 3 AND 4

AMERICAN SOCIETY FOR METALS

●

AMERICAN WELDING SOCIETY

●

INSTITUTE OF METALS DIVISION, A. I. M. E.

●

IRON AND STEEL DIVISION, A. I. M. E.

●

THE WIRE ASSOCIATION

●

Daily programs of the five cooperating Societies, list of exhibitors, and map of Chicago showing International Amphitheatre, Palmer House, and other points of interest, will be carried in "The Review", published in September. Mail the attached coupon now and a copy of this interesting paper will be sent to you as soon as it is off the press.

Mr. W. H. EISENMAN, Managing Director
National Metal Congress and Exposition
7016 Euclid Avenue, Cleveland, Ohio

Please mail me free of charge a copy of the September "Review."

Name_____

Address_____

bration. The simple design eliminates all pistons, toggles and connecting rods and permits the use of a one-piece spindle.

To keep the weight as low as possible the handles are made of magnesium alloy amply reinforced. This gives the grinder the proper balance so much desired by the operator and lessens the fatigue. A step-up in power has been achieved by a new type four-port governor which responds instantly to the load applied. This quick-acting governor never permits the tool to speed up beyond the safety limit and instantly cuts down the air consumption when the load is lifted.

• • •

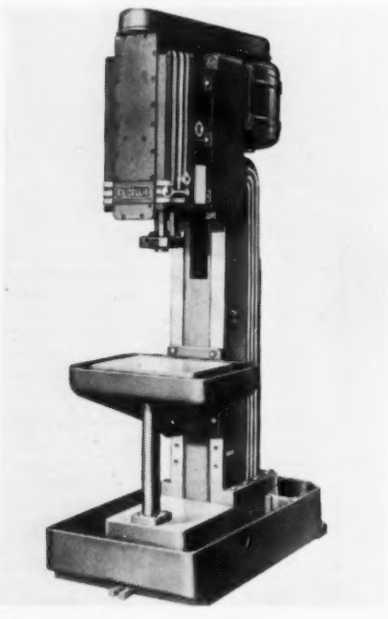
Hydraulic Drilling Machine—

Ex-Cell-O Aircraft & Tool Corp., 1200 Oakman boulevard, Detroit, is announcing a new vertical single-purpose heavy duty drilling machine equipped with an Ex-Cell-O hydraulic power unit. This machine, shown herewith, is particularly adapted for high production multiple operations.

An hydraulic power unit with maximum stroke of either 8 or 10 inches is available and can be adjusted easily to meet the specific requirements of the particular operation. Rapid traverse, feeds, reverse and stop are controlled by adjustable dogs. The two forward feed rates are independently adjustable from the outside of the unit. A two, three, five or seven and a half horsepower electrical motor can be furnished with the unit depending on the requirements of the operations to be handled.

A flange is located on the end of the quill for mounting multiple spindle heads. An accurately ground hole is provided in the spindle nose and has a driving keyway. A machined pad is located on each side of the base and the unit for mounting guide bar brackets if required.

The table of the machine is furnished with adjustments in 3-inch steps which provide the necessary table heights. On applications where coolant is required, a vertical motor-driven centrifugal pump is mounted at the back and base of the column.

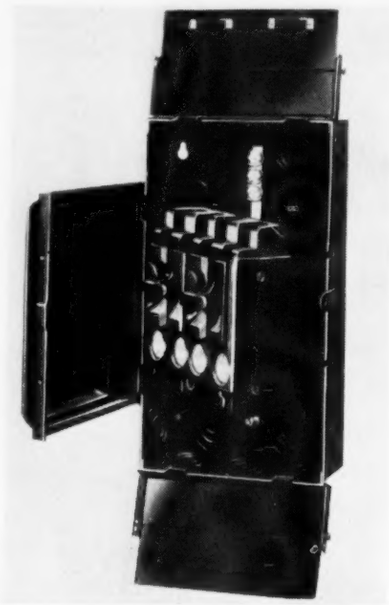


Ex-Cell-O hydraulic drill for high production multiple operations

• • •

Swing-Out Interior Range Switches—

Square D Co., Detroit, which recently announced a series of 30-ampere type D switches with a swing-out interior feature to facilitate wiring, has augmented its line of 60-ampere range switches with a group having this same improvement. With the interior in its normal position, these new switches have the appearance of conventional range panels with the main and range fuse carriers aligned horizontally. To wire the switch, it merely is necessary to loosen two screws in the top and bottom trims, which are also hinged, and swing out the entire interior away from the box.



Square D switch with swing-out interior to facilitate wiring

Another important feature of this new line is the new Square D dead front fuse puller. Ventilation of the fuses is permitted by means of large openings cut into the Bakelite cover.

• • •

Belt Cutting Tool—

Flexible Steel Lacing Co., 4607-31 Lexington street, Chicago, has brought out an 8-inch flat belt cutting tool that employs a new principle in mechanical belt cutting. The

Eight-inch flat belt cutter introduced by Flexible Steel Lacing Co.

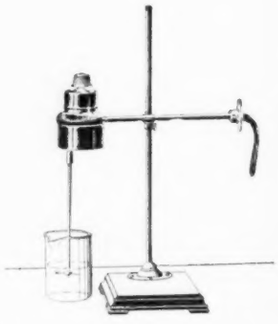
made by pushing a knife through the belt from one edge to the other. This knife is mounted on a plunger in a slot and is operated easily by a direct arm push without mechanical leverage.

The knife, which will cut even the thickest and toughest belts up to 8 inches in width with little effort, is made of special alloy steel, will make several thousand cuts, and is easily replaceable. The belt is held immovable by the equalizing clamp or hold down while the cut is being made, the clamp also serving as a guard for the blade. Clamp and frame are built of aluminum alloy, the weight of the cutter being only 4 pounds and 3 ounces. The cutter is used either on the bench, as illustrated, or is up-ended on the floor, if desired.

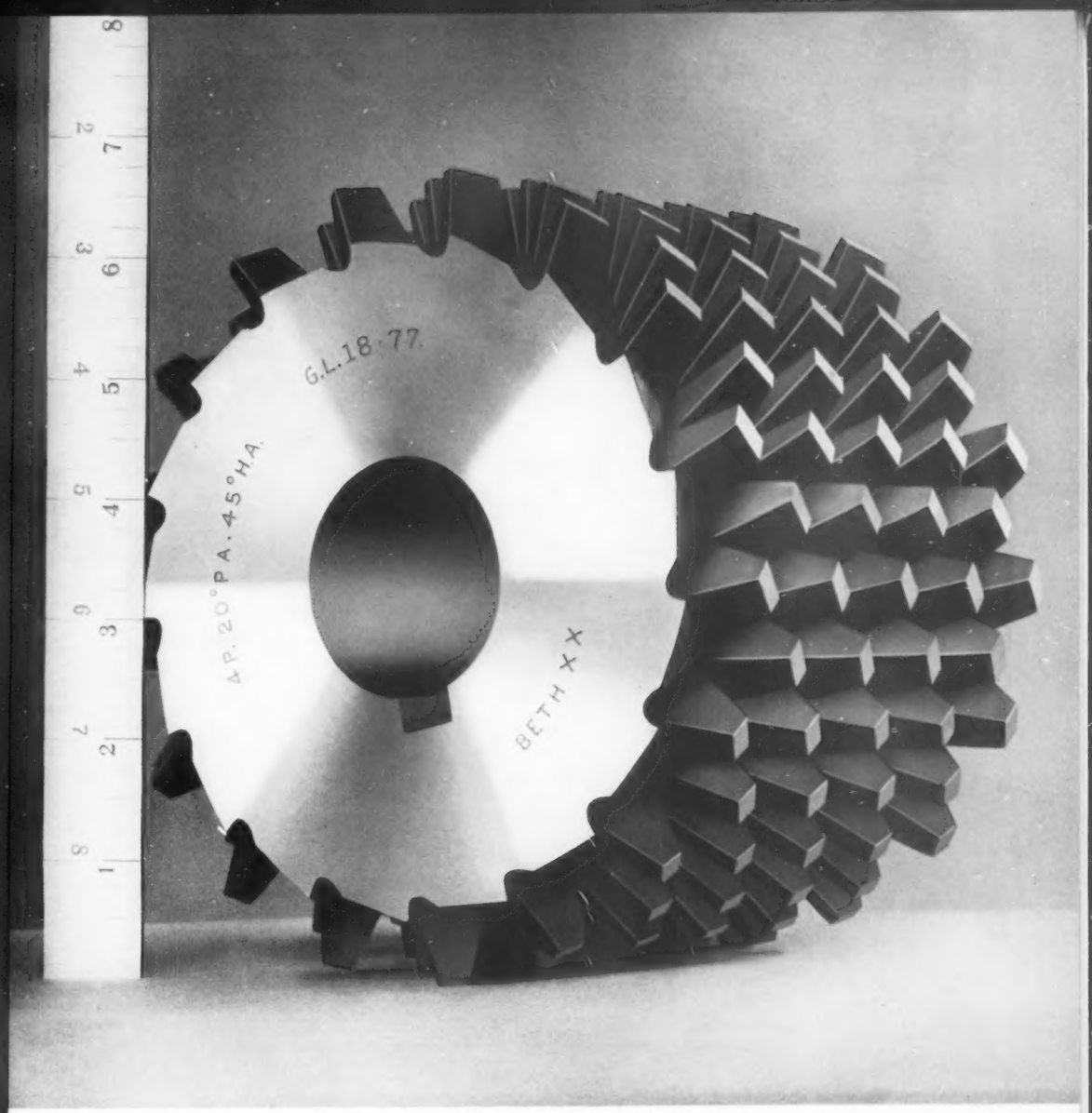
• • •

Laboratory Stirrer—

Chemical Publishing Co. of New York Inc., 175 Fifth avenue, New York, is offering a foolproof laboratory stirrer, shown herewith. The unit is adaptable to a wide range of uses. Actuated by a shaded pole type motor (110 volts, 60 cycle) the company claims it can be operated twenty-four hours daily without damage. It is non-sparking and will not be injured by fumes and vapors. Speed may be varied as needed by the rheostat. It fits an ordinary clamp holder or may be screwed to a shelf or wall. The shaft and propeller are furnished in chromium plate or Monel. A flexible, 6-foot rubber covered cord and soft rubber plug are included.



Laboratory stirrer marketed by Chemical Publishing Co. of New York Inc.



Large, intricate hob made of Bethlehem XX Tool Steel

THE HOB shown above is more than 8 in. in diameter and very intricate. It represents many hours of work by a skilled toolmaker—the filing alone took more than 100 hours. This heavy investment in time made it all the more important for the steel to have stamina to stand up through the water-hardening needed to produce the full hardness requirement.

The maker of the hob, who had used Bethlehem XX Tool Steel for years, selected it for this job. From start to finish the work moved without a hitch. The highly intricate finished hob came through the ordeal of water-hardening without cracking or undue distortion, and the hardness remained within the narrow range specified at all points.

The fact that Bethlehem XX, a moderate-price tool steel, met so completely the demands of this difficult job bespeaks the extra quality, the surplus of stamina, that is found in Bethlehem Tool Steel of every grade. Whatever the purpose for which tool steel is used, there is a grade of Bethlehem Tool Steel that will give a good account of itself. . . . The complete line of Bethlehem Tool Steels is described on the following page.

BETHLEHEM STEEL

AT EVERY STEP WE ASK:

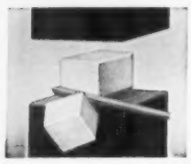
"Which Method will make the best TOOL STEEL?"

AT every stage in the manufacture of Bethlehem Tool Steels there's just one basis for determining the process to be followed. The answer to the question, "*Which method will make the best tool steel?*" solely decides the equipment and method that we use.

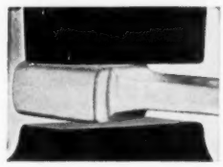
This policy has led to adoption of the following processes, which are outstanding features of practice in the Bethlehem Tool Steel Plant:

HIGH-FREQUENCY INDUCTION MELTING Bethlehem Tool Steels get the right start by melting in the high-frequency electric induction furnace, which makes steel to laboratory standards of accuracy.

LIBERAL INGOT DISCARD Large discards, from both the top and bottom of the ingot, mean that the buyer gets only the "cream" of the tool steel.



HAMMER-COGGING OF INGOTS It's far costlier to hammer-cog ingots than to roll them. But the tremendous impact developed under the 14,000-lb. hammer insures a complete working of the entire ingot and the breaking up of all undesirable ingot structure.



PROGRAM-CONTROLLED ANNEALING The exact heating, soaking and cooling curve desired is obtained by a motor-driven cylinder on which the edge of a plate guides the temperature regulator. Possibilities of human error are eliminated.

RIGOROUS INSPECTION Thoroughly representative cross-sections for inspection are obtained by cutting slabs from the tool-steel billet stock before rolling, and cutting discs from the finished bars. . . . These samples are subjected to hot-acid etch, hardenability tests and microscopic examination.

BETHLEHEM SPECIAL HIGH-SPEED TOOL STEEL
—for the usual high-speed steel applications.

BETHLEHEM EXTRA-SPECIAL HIGH-SPEED TOOL STEEL
—a tool steel for exceptionally severe service.

BETHLEHEM FINISHING TOOL STEEL
—a tungsten alloy water-hardening tool steel.

BETHLEHEM XXX SPECIAL TOOL STEEL
—a carbon finishing tool steel of the highest grade.

BETHLEHEM SUPERIOR TOOL STEEL
—a carbon-vanadium tool steel possessing the characteristics of straight-carbon tool steel combined with superior physical properties.

BETHLEHEM XX TOOL STEEL
—a general-purpose tool steel of extra-fine quality.

BETHLEHEM XCL TOOL STEEL
—for all purposes requiring a uniform and reliable yet comparatively inexpensive grade of tool steel.

BETHLEHEM X TOOL STEEL
—an inexpensive grade of carbon tool steel which many users have found very satisfactory for a wide variety of uses.

BETHLEHEM TOOL ROOM OIL-HARDENING TOOL STEEL
—for intricate dies and master tools which must hold dimensions through heat treatment.

BETHLEHEM No. 71 ALLOY STEEL
—for chisels, shear blades and heavily-stressed machinery parts.

BETHLEHEM TOUGH TOOL STEEL
—a chrome-vanadium steel possessing a high degree of hardness and toughness.

BETHLEHEM LEHIGH DIE AND TOOL STEEL
—a high-carbon, high-chromium steel especially suited for long-run dies.

BETHLEHEM OMEGA TOOL STEEL
—an exceptional impact-resisting steel.

BETHLEHEM No. 57 HOT-WORK TOOL STEEL
—a chrome-tungsten steel for hot-work tools.

BETHLEHEM No. 445 HOT-WORK TOOL STEEL
—a chrome steel for hot-work tools.

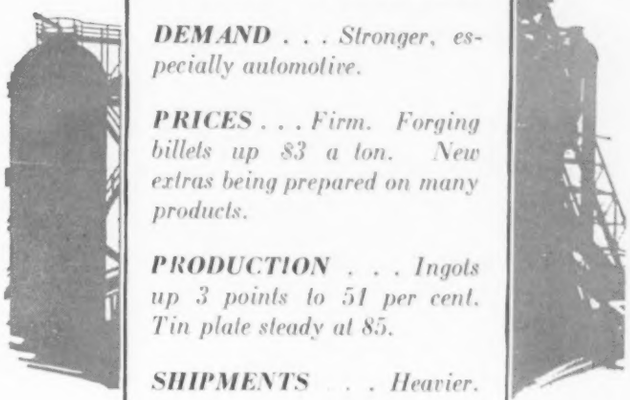
Bethlehem District Offices are located at Atlanta, Baltimore, Boston, Bridgeport, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Houston, Indianapolis, Kansas City, Milwaukee, New York, Philadelphia, Pittsburgh, St. Louis, St. Paul, Washington, Wilkes-Barre, York. *Pacific Coast Distributor:* Pacific Coast Steel Corp., San Francisco, Los Angeles, Seattle, Portland, Honolulu. *Export Distributor:* Bethlehem Steel Export Corp., New York.

BETHLEHEM STEEL COMPANY

GENERAL OFFICES: BETHLEHEM, PA.

Renewed Buying on Broad Front Lifts Rate to 51

Heavy Automotive Releases Still to Come; New Price Extras on Many Products



MARKET IN TABLOID

DEMAND *. . . Stronger, especially automotive.*

PRICES *. . . Firm. Forging billets up $3 a ton. New extras being prepared on many products.*

PRODUCTION *. . . Ingots up 3 points to 51 per cent. Tin plate steady at 85.*

SHIPMENTS *. . . Heavier.*

CONTINUING to respond to increasing demands, steelworks operations last week advanced for the sixth consecutive week, 3 points to 51 per cent.

This was the first time steelworks operations crossed 50 per cent since the week of Feb. 16, when the rate was 53 per cent.

Chicago, where a levelling-off in operations had been anticipated, experienced a fresh wave of buying, with the result operations in that district rose 4 points to 57 per cent. Pittsburgh, which had been holding at 41 per cent for several weeks, advanced 1 more point to 42 per cent. Youngstown was up 6 points to 57; Wheeling 5 to 84; Detroit 6 to 94; eastern Pennsylvania 1 to 32½; New England 11 to 56. Cleveland declined 3 points to 59; Buffalo 3 to 34, while Birmingham held at 35½ per cent.

One of the underlying reasons for this unusual bulge in August steelworks operations is the heavy specifications from automobile manufacturers, with instructions to roll the material and hold it ready for release as soon as needed for new models. About 25 per cent of fresh orders from the industry last week were for immediate shipment. Automobile output in the week increased to 56,386 from 48,067 in the preceding week.

Automobile manufacturers are trying to take full advantage of the present strong retail demand for cars, and making every effort to bring out new models while the weather still is favorable to sales.

Miscellaneous requirements have broadened the base of steel buying, while buoyant reports come from important consuming industries. Implement makers have started the fall season five to six weeks ahead of the customary period. Machine tool builders have the largest volume of orders since 1929, and many report a larger volume of sales than in that year. Many die and pattern shops are working at capacity.

Larger heavy finished steel tonnages were placed, including 12,000 tons of structural shapes and 3500 tons of reinforcing bars for the department of the interior building, Washington. Structural shape awards for the week totaled 27,000 tons, a 26 per cent gain. About 12,000 tons of shapes and bars are scheduled for distribution this week for two tankers ordered by the Gulf Refining Co., Pittsburgh.

Seaboard Air Line has purchased 12,000 tons of rails, and 6000 tons of rails and fastenings have been awarded for relocating Wheeling & Lake Erie railroad tracks in the Muskingum, Ohio, conservancy district.

As the time approaches for opening books for fourth quarter, the whole steel price structure is under scrutiny by producers. New sets of extras are being formulated on many products.

Effective Aug. 20, forging billets have been advanced $3 a gross ton, the base sizes raised, extras applied, and the former base size of 4 x 4 inches put on a steel bar card, which with recent size extras in bars brings the price of 4 x 4-inch to $41 per net ton, compared with the former $32 per gross ton. A new system is being inaugurated in pricing merchant wire according to quantity extras.

It is considered significant that in making these adjustments, producers have not filed prices with the American Iron and Steel institute, as under the code, nor have they waited for the time prescribed in the code for putting quarterly prices in effect.

Raw material prices are strong on a broad and active demand. Further advances in scrap, though less spectacular than recently, put STEEL's scrap composite up 8 cents to $11.96.

Five more blast furnaces have been blown in this month. Merchant pig iron shipments are increasing.

Lake Superior iron ore producers are revising earlier estimates of shipments this year, now expecting 27,000,000 tons, 23 per cent over 1934.

STEEL's iron and steel price composite is up 4 cents to $32.68, on the advance in scrap, while the finished steel index remains $54.

COMPOSITE MARKET AVERAGES

	Aug. 17	Aug. 10	Aug. 3	One Month Ago July, 1935	Three Months Ago May, 1935	One Year Ago Aug., 1934	Five Years Ago Aug., 1930
Iron and Steel	$32.68	$32.64	$32.59	$32.44	$32.35	$32.24	$32.90
Finished Steel	54.00	54.00	54.00	54.00	54.00	54.00	51.72
Steelworks Scrap	11.96	11.88	11.63	10.64	10.27	9.98	12.62

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Aug. 17, 1935	July, 1935	May, 1935	Aug., 1934
Steel bars, Pittsburgh	1.80c	1.80c	1.80c	1.80c
Steel bars, Chicago	1.85	1.85	1.85	1.85
Steel bars, Philadelphia	2.11	2.11	2.11	2.09
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.75
Shapes, Pittsburgh	1.80	1.80	1.80	1.80
Shapes, Philadelphia	2.01½	2.01½	2.01½	2.00½
Shapes, Chicago	1.85	1.85	1.85	1.85
Tank plates, Pittsburgh	1.80	1.80	1.80	1.80
Tank plates, Philadelphia	2.00	1.99	1.99	1.98½
Tank plates, Chicago	1.85	1.85	1.85	1.85
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.85
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.40
Sheets, No. 24, galvan., Pitts.	3.10	3.10	3.10	3.10
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	1.95
Sheets, No. 24, hot anneal., Gary	2.55	2.55	2.55	2.55
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	3.20
Plain wire, Pittsburgh	2.30	2.30	2.30	2.30
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pittsburgh	2.60	2.60	2.60	2.60

Semifinished Material

Sheets bars, open-hearth, Youngs.	$28.00	$28.00	$28.00	$28.00
Sheet bars, open-hearth, Pitts.	28.00	28.00	28.00	28.00
Billets, open-hearth, Pittsburgh	27.00	27.00	27.00	27.00
Wire rods, Pittsburgh	38.00	38.00	38.00	38.00

Pig Iron

	Aug. 17, 1935	July, 1935	May, 1935	Aug., 1934
Bessemer, del. Pittsburgh	$19.81	$19.81	$19.80	$19.76
Basic, Valley	18.00	18.00	18.00	18.00
Basic, eastern, del. eastern Pa.	19.76	19.81	19.81	19.76
No. 2 foundry, del. Pittsburgh	19.31	19.31	19.30	19.26
No. 2, foundry, Chicago	18.50	18.50	18.50	18.50
Southern No. 2, Birmingham	14.50	14.50	14.50	14.50
No. 2X eastern, del. Philadelphia	20.68	20.68	20.68	20.63
Malleable, Valley	18.50	18.50	18.50	18.50
Malleable, Chicago	18.50	18.50	18.50	18.50
Lake Superior charcoal, del. Chi.	24.25	24.25	24.25	24.04
Ferromanganese, del. Pittsburgh	90.13	90.13	90.13	89.79
Gray forge, del. Pittsburgh	18.67	18.67	18.66	18.88

Scrap

Heavy melting steel, Pittsburgh	$13.25	$12.30	$12.00	$11.45
Heavy melt. steel, No. 2, east. Pa.	11.00	9.55	9.25	8.45
Heavy melting steel, Chicago	12.25	10.40	10.20	9.25
Rails for rolling, Chicago	13.75	11.25	11.05	10.50
Railroad steel specialties, Chicago	13.75	12.00	11.40	10.25

Coke

Connellsville, furnace, ovens	$3.25	$3.30	$3.60	$3.60
Connellsville, foundry, ovens	4.00	4.25	4.60	4.60
Chicago, by-product foundry, del.	9.25	9.25	9.25	9.25

Steel, Iron, Raw Material, Fuel and Metals Prices

Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week.

Sheet Steel

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.85c
Gary	1.95c
Chicago, delivered	1.98c
New York, del.	2.20c
Philadelphia, del.	2.16c
Birmingham	2.00c
St. Louis, del.	2.17c
Pacific ports, f.o.b. cars, dock	2.40c

Hot Rolled Annealed No. 24

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, delivered	2.60c
New York, del.	2.75c
Philadelphia, del.	2.71c
Birmingham	2.55c
St. Louis, del.	2.72c
Pacific ports, f.o.b. cars, dock	3.05c

Galvanized No. 24

Pittsburgh	3.10c
Gary	3.20c
Chicago, delivered	3.23c
Philadelphia, del	3.41c
New York, del.	3.45c
Birmingham	3.25c
St. Louis, del.	3.42c
Pacific ports, f.o.b. cars, dock	3.70c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.07c

Cold Rolled No. 10

Pittsburgh	2.50c
Gary	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.81c
New York, del.	2.85c
Pacific ports, f.o.b. cars, dock	3.10c

Cold Rolled No. 20

Pittsburgh	2.95c
Gary	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.26c
New York, del.	3.30c

Enameling Sheets

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c
Gary, No. 10	2.60c
Gary, No. 20	3.20c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base con. (box) Pitts.	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.40c
Do., Gary	3.50c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold stp.	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh	1.80c
New York, del.	2.09c
Philadelphia, del.	1.99c
Boston, delivered	2.22c
Buffalo, delivered	2.05c
Chicago or Gary	1.85c
Cleveland, del.	1.99½c
Birmingham	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific ports, f.o.b. cars, dock	2.35c
St. Louis, delivered	2.07c

Structural Shapes

Pittsburgh	1.80c
Philadelphia, del.	2.01½c
New York, del.	2.06½c
Boston, delivered	2.20½c
Bethlehem	1.90c
Chicago	1.85c
Cleveland, del.	2.00c
Buffalo	1.90c
Gulf Ports	2.20c
Birmingham	1.95c
Pacific ports, f.o.b. cars, dock	2.35c

Bars

Soft Steel

Pittsburgh	1.80c
Chicago or Gary	1.85c
Duluth	1.95c
Birmingham	1.95c
Cleveland	1.85c
Buffalo	1.90c
Detroit, delivered	1.95c
Pacific ports, f.o.b. cars, dock	2.35c
Philadelphia, del.	2.11c
Boston, delivered	2.22c
New York, del.	2.15c
Pitts., forg. qual.	2.05c

Rail Steel

To Manufacturing Trade

Pittsburgh	1.70c
Chicago or Gary	1.75c
Moline, Ill.	1.75c
Cleveland	1.75c
Buffalo	1.80c

Iron

Troy, N. Y.	1.70c
Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia	1.91c
Pittsburgh, refined	2.75-7.50c

Reinforcing

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. cars dock	2.45c
Philadelphia, del.	2.36c

Rail Steel

Straight lengths quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.	1.95c
Gulf ports	2.30c

Wire Products

(Prices apply to straight or mixed carloads; pool cars, or less, 15c up. 10% dis. on nail extras on stright or mixed carloads to one consignee.)

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.60
Cement coated nails	2.60
Galvanized nails, 15 gage and coarser	4.60c
do., 16 gage and finer	5.10c

(Per pound)

Polished staples	3.30c
Galvanized fence staples	3.55c
Barbed wire, galv.	3.00c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$63.00
Plain wire, 6-9 gage to mfg. trade	2.30c

Anderson, Ind., (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pittsburgh or Cleveland	2.90c

Do., Chicago up $1, Worcester, $2.

Cold-Finished Carbon Bars and Shafting

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs	1.95c
20,000 to 59,999 lbs.	1.90c
60,000 to 99,999 lbs.	1.85c
100,000 lbs. and over	1.82½c

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars (Hot)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.45c

Alloy	Diff.	Alloy	Diff.
S.A.E.		S.A.E.	
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20
4100	0.15 to 0.25 Mo		0.50
4600	0.20 to 0.30 Mo. 1.25-1.75 Ni.		1.05
5100	0.80-1.10 Cr		0.45
5100	Cr. spring		base
6100	bars		1.20
6100	spring		0.70
	Cr., Ni., Van.		1.50
	Carbon Van.		0.95
9250	Carbon base plus extras		

Piling

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops

Hot strip to 23⅞-in.

Pittsburgh	1.85c
Chicago, base	1.95c
Birmingham base	2.00c
Detroit, delivered	2.05c
Philadelphia, del.	2.16c
New York, del.	2.20c
Cooperage hoop, Pittsburgh	1.95c
Chicago	2.05c
Cold-rolled strip, Pitts., Cleve.	2.60c
Worcester, Mass.	2.80c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts.	
24-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$20.00
80-85 lbs.	$24.00
100 lbs.	$25.00
Light rails, billet qual. Pitts., Chi.	$35.00
Do., reroll. qual.	34.00
Angle bars, billet, Gary, Ind., So. Chi.	2.55c
Do., axle steel	2.10c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs. up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots, Dec. 1, 1932, lists, 10% extra for less full containers.

Carriage Bolts

All sizes, cut thread	70-10-5 off
Rolled thread, ½ x 6, smaller	70-10-5 off

Machine Bolts

All sizes cut thread lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts stud bolts	70-10-5 off
Tire bolts	60-5 off
Stove bolts, 75 off in pkgs.; 83 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.	
Rolled thread machine, ½ x 6, smaller	70-10-5 off
Step bolts	70-5 off
Elevator bolts	70-5 off

Nuts

S.A.E. semifinished hex.; ½ to ⅞-inch	70-10-5 off
Do., ½ to 1-inch	70-10-5 off
Do., over 1-inch	70 off

Hexagon Cap Screws

Milled	85-10 off
Upset, 1-in., smaller	87½ off

Square Head Set Screws

Upset, 1-in., smaller	80 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	2.90c
Struc., c. l., Chicago	3.00c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila., to jobbers & large nut, bolt mfrs.	$6.25 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more no discount on size extras	$3.05
Do. under 5 kegs; no discount on size extras	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago del. 2½ points less. Wrought pipe, Pittsburgh.

Butt Weld

In.	Blk.	Gal.
Steel		
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55
Iron		
½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

Lap Weld

Steel		
2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½
Iron		
2	37	22½
2½—3½	38	25
4—8	40	28½

Line Pipe

Steel	
½, butt weld	57½
⅛-inch, butt weld	50½
¼—⅜, butt weld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63
Iron	

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

Boiler Tubes

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

Seamless Boiler Tubes

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound. Less-carloads revised as of July 1, 1935 card.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$39.00-40.00
4-in., Birmingham	42.00-43.00
4-in., Chicago	50.40-51.40
6 to 24-in. Chicago	47.40-48.40
6-in. & over, east fdy.	43.00
Do., 4-in.	46.00

Class A pipe $3 over Class B.

Stnd. fitgs., Birm. base	$100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown	$27.00
Philadelphia	32.67
Duluth	31.00

Forging Billets

6 x 6 to 9 x 9-in., base

*Pitts., Chi., Buff.	35.00
*Forging, Duluth	37.00

Sheet Bars

Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt.	28.00

Slabs

Pitts., Cleve., Young.	27.00

Wire Rods

(Common; combination up $2)

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point	1.70c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.25- 3.40
Connellsville, fdry.	4.00- 4.10
Connel. prem. fdry.	5.00- 5.10
New River fdry.	6.00
Wise county fdry.	4.45- 5.00
Wise county fur.	4.00- 4.50

By-Product Foundry

Newark, N. J., del.	9.20
Chi., ov., outside del.	8.50
Chicago, del.	9.25
New England, del.	11.00
St. Louis, del.	9.25
Birmingham, ovens	6.00
Indianapolis, del.	8.75
*Cincinnati, del.	9.00
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit ov., out. del.	8.50
Philadelphia, del.	9.03

Coke By-Products

Per gallon, producers' plants.

Tank lots	Spot
Pure and 90% benzol	15.00c
Toluol	30.00c
Solvent naphtha	30.00c
Commercial xylol	30.00c

Per lb. f.o.b. New York.

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls., to jobbers	4.50c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.20

†Western prices, ½-cent up.

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry.	Malle-able	Basic	Besse-mer
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Birmingham, Ala., southern del...	14.50	14.50	13.50	19.00
Buffalo	18.50	19.00	17.50	19.50
Chicago	18.50	18.50	18.00	19.00
Cleveland	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
Duluth	19.00	19.00	.....	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Everett, Mass.	19.50	20.00	19.00	20.50
Hamilton, O.	18.50	18.50	18.00	19.00
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Sparrows Point, Md.	19.50	.....	19.00	.....
Swedeland, Pa.	19.50	20.00	19.00	20.50
Toledo, O.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
Delivered from Basing Points:				
Akron, O., from Cleveland	19.76	19.76	19.26	20.26
Baltimore from Birmingham	20.08	.....	18.96	.....
Boston from Birmingham	19.62	.....	19.50	.....
Boston from Everett, Mass.	20.00	20.50	19.50	21.00
Boston from Buffalo	20.00	20.50	19.50	21.00
Brooklyn, N. Y., from Bethlehem	21.93	22.43	.....	.....
Brooklyn, N. Y., from Bmghm..	21.55	.....	.....	.....
Canton, O., from Cleveland	19.76	19.76	19.26	20.26
Chicago from Birmingham	†18.72	.....	18.60	.....
Cincinnati from Hamilton, O.	19.51	19.51	19.01	.....
Cincinnati from Birmingham	19.38	.....	19.40	.....
Cleveland from Birmingham	19.04	.....	18.92	.....
Indianapolis from Hamilton, O..	20.93	20.93	20.43	21.43
Mansfield, O., from Toledo, O.	20.26	20.26	19.76	20.76
Milwaukee from Chicago	19.57	19.57	19.07	20.07
Muskegon, Mich., from Chicago, Toledo or Detroit	21.60	21.60	21.10	22.10
Newark, N. J., from Birmingham	20.61	.....	.....	.....
Newark, N. J., from Bethlehem..	20.99	21.49	.....	.....
Philadelphia from Birmingham....	19.93	.....	19.1	.....
Philadelphia from Swedeland, Pa.	20.31	20.81	19.81	.....
Pittsburgh district from Neville Island	Neville base plus 67c, 81c and $1.21 switching charges			
Saginaw, Mich., from Detroit	20.75	20.75	20.25	20.25

Delivered from Basing Points:	No. 2 Fdry.	Malle-able	Basic	Besse-mer
St. Louis, northern	19.00	19.00	18.50	.....
St. Louis from Birmingham	†18.62	.....	18.50	.....
St. Paul from Duluth	20.94	20.94	.....	21.44

†Over 0.70 phos.

Low Phos

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $23.50. Phila. base, standard and copper bearing, $24.63.

Gray Forge		Charcoal	
Valley furnace	18.00	Lake Superior fur.	21.00
Pitts. dist. fur.	18.00	Do., del. Chicago	24.25
		Lyle, Tenn.	21.50

Silvery†

Jackson County, O., base; 6% $22.75; 7—$23.75; 8—$24.75; 9—$25.70; 10—$26.75; 11—$27.75. Buffalo base prices, up $1.25.

Bessemer Ferrosilicon†

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon: 2 to 3%, $1 per ton additional; each unit over 3%, $1 per ton additional.

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$55.00

First Quality.

Pa., Ill., Md., Mo.	$45.00
Alabama, Ga., Ky.,	$40.00-45.00

Second Quality

Pa., Ill., Ky., Md., Mo.	40.00
Ga., Ala.	35.00

Ohio

First quality	$40.00
Intermediary	37.00
Second quality	28.00

Malleable Bung Brick

All bases	50.00

Silica Brick

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	40.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$45.00
Chemically bonded chrome brick	45.00
Magnesite brick	65.00
Chemically bonded magnesite brick	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$18.75-19.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$14.50

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base	85.00
Do., del. Pittsburgh	90.13
Spiegeleisen, 19-20% dom. Palmerton, Pa., spot†	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	90.00
2% carbon, 95.00; 1%,	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.00
Ferrotungsten, stand., lb. cont. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont.	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply.

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Casting, refinery	Straits Tin: New York Spot	Straits Tin: Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Alumi-num 99%	Antimony Chinese Spot, N. Y.	Nickel Cath-odes
Aug. 10	8.00	8.12½	7.50	51.62½	49.55	4.20	4.05	4.50	*19.00	13.00	35.00
Aug. 12	8.00	8.12½	7.50	50.50	48.60	4.20	4.05	4.50	*19.00	13.00	35.00
Aug. 13	8.00	8.12½	7.50	49.62½	48.20	4.20	4.05	4.50	*19.00	13.00	35.00
Aug. 14	8.00	8.12½	7.50	48.75	48.00	4.20	4.05	4.50	*19.00	13.00	35.00
Aug. 15	8.00	8.12½	7.50	48.25	47.75	4.20	4.05	4.50	*19.00	13.00	35.00
Aug. 16	8.00	8.12½	7.50	48.75	48.25	4.20	4.05	4.50	*19.00	13.00	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 9.00c Conn. copper.

Sheets	
Yellow brass (high)	13.62½
Copper, hot rolled	15.00
Lead, cut to jobbers	7.75
Zinc, 100-lb. base	9.50
Tubes	
High yellow brass	15.37½
Seamless copper	15.25
Rods	
High yellow brass	12.12½
Copper, hot rolled	12.25
Anodes	
Copper untrimmed	12.75
Wire	
Yellow brass (high)	14.12½

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
New York	4.75- 5.00
*Cleveland	5.25- 5.50
*Chicago	4.75- 5.00
St. Louis	4.50- 4.75
Heavy Copper and Wire	
New York, No. 1	6.00- 6.25
*Chicago, No. 1	5.87½-6.12½
Cleveland	5.50- 5.75
St. Louis, No. 1	6.00- 6.25
Light Copper	
New York	4.75- 5.00
*Chicago	4.25- 4.50
Cleveland	4.75- 5.00
St. Louis	4.75- 5.00
Light Brass	
*Chicago	2.50- 2.75
Cleveland	2.50- 2.75
St. Louis	2.25- 2.50
Lead	
New York	3.12½- 3.25
*Cleveland	3.15- 3.40
*Chicago	3.00- 3.25
St. Louis	3.30- 3.45
Zinc	
New York	2.00- 2.25
*Cleveland	2.10- 2.35
*St. Louis	2.65- 2.75
Aluminum	
Borings, Cleveland	7.50- 8.00
*Mixed, cast, Clev.	12.50-12.75
Mixed, cast, St. L.	11.75-12.00
*Clips, soft, Cleve.	14.00-14.50

SECONDARY METALS

Brass ingot, 85-5-5-5	8.00
Stand. No. 12 alum.	16.25

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	8.50- 9.00
Boston, dock, expt.	8.75- 9.00
Boston, domestic	7.25- 7.50
Buffalo, No. 1	11.25-11.75
Buffalo, No. 2	10.00-10.50
Chicago, No. 1	12.00-12.50
Cleveland, No. 1	11.25-11.75
Cleveland, No. 2	10.50-11.00
Detroit, No. 1	9.25- 9.75
Detroit, No. 2	7.75- 8.25
Eastern Pa., No. 1	11.50
Eastern Pa., No. 2	10.50-11.00
Federal, Ill.	8.50- 9.00
Granite City, R. R.	8.25- 8.75
Granite City, No. 2	7.25- 7.75
N. Y., deal, No. 2	7.50
N. Y., deal. barge	8.50
Pittsburgh, No. 1	13.00-13.50
Pittsburgh, No. 2	11.25-11.75
St. Louis	7.50- 8.00
Valleys, No. 1	13.00-13.50

COMPRESSED SHEETS

Buffalo, dealers	10.00-10.50
Chicago, factory	11.50 12.00
Chicago, dealer	10.25-10.75
Cleveland	11.00-11.50
Detroit	9.75-10.25
E. Pa., new mat.	10.00-10.50
Pittsburgh	13.00-13.50
St. Louis	6.25- 6.75
Valleys	12.50

BUNDLED SHEETS

Buffalo	7.25- 7.75
Cincinnati, del.	7.00- 7.50
Cleveland	9.50-10.00
Pittsburgh	11.00-11.50
St. Louis	4.50- 5.00

SHEET CLIPPINGS, LOOSE

Chicago	7.00- 7.50
Cincinnati	6.50- 7.00
Detroit	5.00- 5.50
St. Louis	4.75- 5.25

STEEL RAILS, SHORT

Birmingham	12.00-12.50
Buffalo	13.00-13.50
Chicago (3 ft.)	14.00-14.50
Chicago (2 ft.)	15.00-15.50
Cincinnati, del.	12.00-12.50
Detroit	11.50-12.00
Pitts., open-hearth, 3 ft. and less	15.00-15.50
St. Louis, 2 ft.&less	13.00-13.50

STEEL RAILS, SCRAP

Boston	7.50- 7.75
Chicago	12.00-12.50
Pittsburgh	13.25-13.75
St. Louis	11.00-11.50
Buffalo	11.50-12.00

STOVE PLATE

Birmingham	5.75- 6.00
Boston, dealers	3.50- 3.75
Buffalo	9.75-10.25
Chicago, net	8.00- 8.50
Cincinnati, dealers	6.50- 7.00
Detroit, net	6.50- 700
Eastern Pa.	8.50
N. Y., deal. fdry.	6.00
St. Louis	5.50- 6.00

COUPLERS, SPRINGS

Buffalo	12.75-13.25
Chicago, springs	13.50-14.00
Eastern Pa.	13.50
Pittsburgh	15.00-15.50
St. Louis	12.00-12.50

ANGLE BARS—STEEL

Chicago	14.00-14.50
St. Louis	10.00-10.50

RAILROAD SPECIALTIES

Chicago	13.50-14.00

LOW PHOSPHORUS

Buffalo, billets and bloom crops	14.50-15.00
Cleveland, billet, bloom crops	14.00-14.50
Eastern Pa., crops	13.00-14.00
Pittsburgh, billet, bloom crops	15.50-16.00
Pittsburgh, sheet bar crops	14.00-14.50

FROGS, SWITCHES

Chicago	12.00-12.50
St. Louis, cut	10.25-10.75

SHOVELING STEEL

Chicago	12.00-12.50
Federal, Ill.	8.50- 9.00
Granite City, Ill.	7.25- 7.75

RAILROAD WROUGHT

Birmingham	8.00- 8.50
Boston, dealers	6.00- 6.50
Buffalo, No. 1	10.00-10.50
Buffalo, No. 2	11.25-11.75
Chicago, No. 1, net	9.50-10.00
Chicago, No. 2	12.00-12.50
Cincinnati, No. 2	9.00- 9.50
Eastern Pa.	11.50
N. Y., No. 1, deal.	7.50- 8.00
St. Louis, No. 1	6.50- 7.00
St. Louis, No. 2	9.25- 9.75

SPECIFICATION PIPE

Boston	3.00- 3.25
Eastern Pa.	9.00- 9.50
New York, dealers	3.50- 4.00

BUSHELING

Buffalo, No. 1	10.00-10.50
Chicago, No. 1	11.00-11.50
Cinci., No. 1, deal.	7.00- 7.50
Cincinnati, No. 2	4.00- 4.50
Cleveland, No. 2	7.25- 7.75
Detroit, No. 1, new	8.00- 8.50
Valleys, new, No. 1	12.00-12.50

MACHINE TURNINGS

Birmingham	3.50- 4.00
Boston, dealers	2.25- 2.50
Buffalo	6.00- 6.50
Chicago	6.50- 7.00
Cincinnati, dealers	5.00- 5.50
Cleveland	6.50- 7.00
Detroit	5.00- 5.50
Eastern Pa.	6.00- 6.50
New York, dealers	3.00- 3.25
Pittsburgh	9.00- 9.50
St. Louis	2.25- 2.75
Valleys	8.50- 9.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	2.50- 2.75
Buffalo	6.75- 7.00
Cincinnati, dealers	5.00- 5.50
Cleveland	7.25- 7.75
Detroit	5.25- 5.75
Eastern Pa.	5.00
New York, dealers	1.50- 1.75
Pittsburgh	7.00- 8.00

CAST IRON BORINGS

Birmingham, plain	3.50- 4.00
Boston, chemical	5.50- 6.50
Boston, dealers	3.25- 3.50
Buffalo	6.75- 7.00
Chicago	6.50- 7.00
Cincinnati, dealers	5.00- 5.50
Cleveland	7.25- 7.75
Detroit	5.25- 5.75
E. Pa., chemical	11.00-12.00
New York, dealers	1.50- 1.75
St. Louis	2.00- 2.50

PIPE AND FLUES

Cincinnati, dealers	5.50- 6.00

RAILROAD GRATE BARS

Buffalo	8.50- 9.00
Chicago, net	7.50- 8.00
Cincinnati	4.50- 5.00
Eastern Pa.	8.50
New York, dealers	4.00- 4.50
St. Louis	4.50- 5.00

FORGE FLASHINGS

Boston, dealers	5.50- 5.75
Buffalo	10.00-10.50
Cleveland	9.50-10.00
Detroit	7.50- 8.00
Pittsburgh	11.00-11.50

FORGE SCRAP

Boston, dealers	4.50
Chicago, heavy	13.00-13.50
Eastern Pa.	11.00-11.50

ARCH BARS, TRANSOMS

St. Louis	10.00-10.50

AXLE TURNINGS

Boston, dealers	3.00- 3.50
Buffalo	10.50-11.00
Chicago, elec. fur.	12.00-12.50
Cleveland	7.00- 7.50
Eastern Pa.	9.50
St. Louis	7.00- 7.50

STEEL CAR AXLES

Birmingham	12.00-12.50
Boston, ship. point.	10.00-10.50
Buffalo	12.50-13.00
Chicago, net	14.25-14.75
Eastern Pa.	16.00
St. Louis	12.00-12.50

SHAFTING

Boston, ship. point.	12.25-12.50
Eastern Pa.	17.50
New York, dealers	13.25-13.50
St. Louis	11.00-11.50

CAR WHEELS

Birmingham	9.00-10.00
Boston, iron deal.	6.00- 6.25
Buffalo, iron	11.00-11.50
Buffalo, steel	12.75-13.25
Chicago, iron	12.50-13.00
Chicago, rolled steel	13.50-14.00
Cincinnati, iron	9.50-10.00
Eastern Pa., iron	11.00
Eastern Pa., steel	13.50
Pittsburgh, iron	13.00-13.50
Pittsburgh, steel	15.00-15.50
St. Louis, iron	8.50- 9.00
St. Louis, steel	11.50-12.00

NO. 1 CAST SCRAP

Birmingham	8.50- 9.50
Boston, No. 1 mach.	8.50- 9.00
Boston, No. 2	7.50- 8.00
Boston, tex. con.	8.50- 9.00
Buffalo, cupola	11.00-11.50
Buffalo, mach.	12.00-12.50
Chicago, agri. net	9.50-10.00
Chicago, auto	10.50-11.00
Chicago, mach. net	11.00-11.50
Chicago, railr'd net	10.50-11.00
Cinci., mach. cup	9.50-10.00
Cleveland, cupola	11.75-12.25
Detroit, net	10.00-10.50
Eastern Pa., cupola	11.00-12.00
E. Pa., mixed yard	9.50-10.00
Pittsburgh, cupola	14.00-14.50
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	8.00- 8.50
St. L., No. 1 mach.	9.00- 9.50

HEAVY CAST

Boston, del.	5.50- 5.75
Buffalo, break.	9.50-10.00
Cleveland, break.	10.00
Detroit, No. 1, mach. net	10.50-11.00
Detroit, break.	8.50- 9.00
Detroit, auto net	10.75-11.25
Eastern Pa.	10.50
N. Y., break. deal.	6.25- 6.50
Pittsburgh	12.50-13.00

MALLEABLE

Birmingham, R. R.	10.50-11.00
Boston, consum.	12.00-12.50
Buffalo	13.00-13.50
Chicago, R. R.	14.50-15.00
Cincinnati, agri. del.	9.50-10.00
Cleveland, rail	14.50-15.00
Detroit, auto	11.50-12.00
St. Louis, R. R.	10.75-11.25
Eastern Pa., R. R.	11.00-11.50

RAILS FOR ROLLING

5 feet and over

Birmingham	10.50-11.00
Boston, dealers	8.00- 8.50
Buffalo	11.00-11.50
Chicago	13.50-14.00
Eastern Pa.	12.50-13.00
New York, dealer	8.50- 9.00
St. Louis	11.50-12.00

LOCOMOTIVE TIRES

Chicago (cut)	13.50-14.00
St. Louis, No. 1	9.00- 9.50

LOW PHOS. PUNCHINGS

Buffalo	12.75-13.25
Chicago	14.50-15.00
Eastern Pa.	13.00-14.00
Pittsburgh (heavy)	14.50-15.00
Pittsburgh (light)	14.00-14.50

Iron Ore

Lake Superior Ore

Gross ton, 51½%

Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

Eastern Local Ores

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

Foreign Ore

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. low phos.	10.00-10.50
Swedish basic, 65%	9.00
Swedish low phos.	10.00
Spanish No. Africa basic, 50 to 60%	9.50
Tungsten, spot sh. ton unit, duty pd.	$15.50-16.00
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$18.00-19.00

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.

Caucasian, 52-55%	26.00
So. African, 52%	26.00
So. Afr., 49-51%	24.00
Indian, 58-60%	nominal
Indian, 48-50%	nominal

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	
Baltimore*.....	2.95c
Boston††	3.00c
Buffalo	3.00c
Chattanooga..	3.31c
Chicago	2.95c
Cincinnati	3.17c
Cleveland	2.95c
Detroit	3.04c
Houston	3.00c
Los Angeles..	3.60c
Milwaukee	3.06c
New Orleans..	3.30c
New York‡(d)	3.26c
Pittsburgh (h)	2.90c
Philadelphia*	2.93c
San Francisco	3.60c
Seattle	3.60c
St. Louis.....	3.20c
St. Paul	3.00c
Tulsa	3.25c
IRON BARS	
Portland	3.40c
Chattanooga..	3.31c
Baltimore*.....	3.05c
Chicago	2.75c
Cincinnati	3.17c
New York‡(d)	3.36c
Philadelphia*	2.93c
St. Louis.....	3.20c
Tulsa	3.25c
REINFORCING BARS	
Buffalo	2.60c
Chattanooga..	3.31c
Chicago 2.10c-	2.60c
Cleveland (c)	2.10c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl..	2.45c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	2.45c
St. Louis.....	3.25c
Tulsa	3.25c
Young. 2.30c-	2.60c
SHAPES	
Baltimore*.....	3.00c
Boston††	3.19c
Buffalo	3.25c
Chattanooga..	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland	3.31c
Detroit	3.42c
Houston	3.00c
Los Angeles..	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.37c
Philadelphia*	2.98c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.45c
St. Paul.....	3.25c
Tulsa	3.50c
PLATES	
Baltimore*.....	3.00c
Boston††	3.21c
Buffalo	3.37c
Chattanooga..	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland, ¼-in. and over	3.31c
Detroit	3.42c
Detroit, ⅜-in.	3.65 c
Houston	3.00c
Los Angeles..	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.40c
Philadelphia*	2.98c
Phila. floor....	4.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.45c
St. Paul.....	3.25c
Tulsa	3.50c
NO. 10 BLUE	
Baltimore*.....	3.10c
Boston††	3.30c
Buffalo	3.62c
Chattanooga..	3.36c
Chicago	3.05c
Cincinnati	3.22c
Cleveland	3.11c
Det., 8-10 ga.	3.14c
Houston	3.35c
Los Angeles..	3.70c
Milwaukee	3.16c
New Orleans	3.55c
New York.....	3.31c
Portland	3.75c
Philadelphia*	3.08c
Pittsburgh(h)	2.95c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.45c
St. Paul.....	3.45c
Tulsa	3.70c
NO. 24 BLACK	
Baltimore*†....	3.60c
Boston (g)	3.95c
Buffalo	3.25c
Chattanooga..	4.21c
Chicago	3.85c
Cincinnati	4.07c
Cleveland	3.91c
Detroit	3.94c
Los Angeles..	4.35c
Milwaukee	3.96c
New York.....	3.89c
Philadelphia*†	3.60c
Pitts.** (h)....	3.55c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St. Louis	4.10c
St. Paul.....	3.695c
Tulsa	4.75c
NO. 24 GALV. SHEETS	
Baltimore*†....	4.30c
Buffalo	4.00c
Boston (g)....	4.65c
Chattanooga..	4.86c
Chicago (h)..	4.55c
Cincinnati	4.72c
Cleveland	4.61c
Detroit	4.72c
Houston	4.40c
Los Angeles..	4.95c
Milwaukee	4.66c
New Orleans	4.50c
New York.....	4.50c
Philadelphia*†	4.30c
Pitts** (h)....4.15-	4.45c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.65c
St. Paul.....	4.19c
Tulsa	5.10c
BANDS	
Baltimore*.....	3.20c
Boston††	3.30c
Buffalo	3.42c
Chattanooga..	3.61c
Chicago	3.30c
Cincinnati	3.47c
Cleveland	3.36c
Detroit, ⅜-in. and lighter	3.39c
Houston	3.25c
Los Angeles..	4.10c
Milwaukee	3.41c
New Orleans	3.95c
New York(d)	3.56c
Philadelphia..	3.18c
Pittsburgh (h)	3.20c
Portland	4.25c
San Francisco	4.25c
Seattle	4.25c
St. Louis	3.55c
St. Paul.....	3.20c
Tulsa	3.45c
HOOPS	
Baltimore	2.30c
Boston	4.30c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.47c
Det., No. 14 and lighter	3.39c
Los Angeles..	5.85c
Milwaukee	3.41c
New York.....	3.56c
Philadelphia..	3.43c
Pittsburgh(h)	3.70c
Portland	5.60c
San Francisco	6.15c
Seattle	5.60c
St. Louis	3.55c
St. Paul.....	3.75c
COLD FIN. STEEL	
Baltimore (c)	3.58c
Boston 3.75c-	3.90c
Buffalo (h) ..	3.40c
Chattanooga*	3.98c
Chicago (h)..	3.35c
Cincinnati	3.57c
Cleveland (h)	3.35c
Detroit	3.49c
Los Ang.(f) (d)	5.85c
Milwaukee	3.46c
New Orleans	4.15c
New York...3.81c-	4.31c
Philadelphia..	3.61c
Pittsburgh	3.20c
Portland (f) (d)	6.00c
San Fran.(f) (d)	5.95c
Seattle (f) (d)	6.00c
St. Louis	3.60c
St. Paul	3.05c
Tulsa	4.50c
COLD ROLLED STRIP	
Boston, 0.100-in., 500 lb. lots	5.35c
Buffalo	3.39c
Chicago	3.27c
Cincinnati (b)	3.44c
Cleveland (b)	3.20c
Detroit	3.33c
New York.....	3.36c
St. Louis	3.45c
TOOL STEELS	
(Applying on or east of Mississippi river; west of Mississippi 1c up)	
	Base
High speed 57c	
High carbon, high chrome 37c	
Oil hardening 22c	
Special tool 20c	
Extra tool 17c	
Regular tool 14c	
Uniform extras apply	
BOLTS AND NUTS	
(100 pounds or over)	Discount
Chicago (a).....	70
Cleveland	70
Detroit	70–5
Milwaukee	70
Pittsburgh	70

(a) Under 100 pounds, 65 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Minus quant. diff.; (e) New mill classif.; (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less.

‡Domestic bars; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; †New extras apply; ††Base 40,000 lbs., extras on less.

Prices on heavier lines are subject to new quantity differentials; 399 lbs. and less, up 50 cts.; 400 to 9999 lbs., base; 10,000 to 19,999 lbs., 15 cts. under; 20,000 to 39,999 lbs., 25 cts. under; 40,000 lbs. and over, 35 cts. under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, August 15

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon..	$15.59 3 2 6	$13.72	1 14 0
Basic bessemer.....	15.59 3 2 6*	12.91	1 12 0
Hematite, Phos. .03-.05....	16.34 3 5 6	.....	.....
SEMIFINISHED STEEL			
Billets.....	$27.35 5 10 0	$18.98	2 7 0
Wire rods, No. 5 gage.....	42.41 8 10 0	36.38	4 10 0
FINISHED STEEL			
Standard rails.....	$38.67 7 15 0	$36.34	5 10 0
Merchant bars.....	1.67c 7 10 0	1.14c to 1.19c	3 2 6 to 3 5 0
Structural shapes.....	1.64c 7 7 6	1.12c	3 1 6
Plates, †¼ in. or 5 mm....	1.78c 8 0 0	1.54c	4 5 0
Sheets, black, 24 gage or 0.5 mm.....	2.06c 9 5 0	2.12c	5 16 0††
Sheets, gal., 24 gage, corr...	2.51c 11 5 0	3.19c	8 15 0
Bands and strips.....	1.90c 8 10 0	1.45c	4 0 0
Plain wire, base.....	2.06c 9 5 0	1.85c	5 7 6
Galvanized wire, base.....	2.40c 10 15 0	2.28c to 2.32c	6 5 6 to 6 7 6
Wire nails, base.....	2.68c 12 0 0	2.10c	5 15 0
Tin plate, box 108 lbs.....	$ 4.49 0 18 2	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d	French Francs		Belgian Francs		Reich Marks
Sdy. pig iron, Si. 2.5.....	$16.84 3 7 6(a)	$17.26	260	$12.54	370	$25.50	63
Basic bessemer pig iron....	17.43 3 10 0(a)*	12.62	190	11.19	330	28.13	†69.50
Furnace coke.....	4.12 0 16 6	6.31	95	3.90	115	7.69	19
Billets.....	27.35 5 10 0	28.55	430	18.31	540	39.05	96.50
Standard rails.....	1.84c 8 5 0	2.08c	694	1.65c	1,100	2.43c	132
Merchant bars.....	1.92c 8 12 0	1.68c	560	.90c	600	2.02c	110
Structural shapes.....	1.95c 8 15 0	1.65c	550	.90c	600	1.98c	107.50
Plates, †¼-in. or 5 mm....	2.02c 9 1 3	2.10c	700	1.05c	700	2.34c	127
Sheets, black.....	2.45c 11 0 0§	1.86c	620‡	1.24c	825‡	2.65c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.....	2.90c 13 0 0	3.45c	1,150	2.25c	1,500	6.80c	370
Plain wire.....	2.06c 9 5 0	3.39c	1,130	1.73c	1,150	3.22c	175
Bands and strips.....	2.09c 9 7 0	1.95c	650	1.26c	840	2.34c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel a del. Middlesbrough. b hematite. ††Close annealed

**Gold pound sterling carries a premium of 65.3 per cent over paper sterling.

Solving
the Peculiar and Personal Problems of the Industrial Advertiser

NATIONAL INDUSTRIAL ADVERTISERS ASSOCIATION, INC.

537 So. Dearborn St. Chicago, Illinois

TO Advertising Managers, Sales Managers and Executives who sell products to Industrial America:

The 1935 convention of the National Industrial Advertisers Association will bring together in a single three day conference, the answers to many of the problems now confronting the manufacturer covering the advertising, merchandising and sale of industrial products.

The program, carefully planned and balanced by men who have devoted their careers to advertising and sales promotion, is practical, all embracing and highly instructive. It is advanced in the sense of being fully up-to-date but has due regard for established fundamentals.

This program has been created for the executive who is advertising minded and uses advertising as a useful tool, as well as for the specialist who is highly skilled in his profession. Every one who attends this conference conscientiously will carry ideas away which he can profitably employ in his business . . . It is recommended very seriously to all thinking executives.

The conference will be held in Pittsburgh, Pa. September 18th, 19th and 20th at the William Penn Hotel. It is suggested that advance reservations be made through the secretary of the Industrial Advertising Council, P.O. Box 1198, Pittsburgh, Pa., to insure satisfactory accommodations.

Yours sincerely

NATIONAL INDUSTRIAL ADVERTISERS ASSN.

D. Clinton Grave

General Chairman,
1935 Pittsburgh Conference

Bars

Bar Prices, Page 62

Cleveland—Following recent announcement of new steel bar extras, which went in effect Aug. 10, and the subsequent adjustment in forging quality billets, classifying all sizes of these billets under 5 x 5 inches as steel bars, it is learned that a new set of extras affecting many other heavy finished steel products is in preparation. The reclassification of billets does not go in effect until Aug. 20. Whereas the former price of 4 x 4-inch forging billets was $32 per gross ton, Pittsburgh, sold as a bar mill product, which in reality it has become, due to exacting specifications, the price will be $41 per net ton. The new extras on steel bars, however, are said to be working out to the advantage of regular forging bar customers.

Demand is strong, and bookings well ahead of July. Buoyant reports from consuming industries. The agricultural implement industry is starting its fall schedule, five to six weeks ahead of the usual period. Machine tool builders have the largest volume of orders since 1929, and for some, better than 1929. Die and pattern shops are operating at capacity. Automotive orders are down slightly, but mills have substantial backlogs for early release.

Pittsburgh—The recent decision to place all forged quality billets under 5 x 5 inches down to 4 x 4 inches on the bar card recognizes the increasing call for quality, surface and other tolerances which many bar users have demanded. Revised cards of extras on bars which have been issued and in force since Aug. 10 finds a number of sales having tested this changed method of quoting. Automobile manufacturers are beginning to release against orders covering needs for the remainder of the third quarter. Base prices on carbon steel bars remain 1.80c, and on alloy steel bars 2.45c, base, Pittsburgh.

Chicago—Steel bar demand shows occasional gains from miscellaneous consumers, while better activity is noted in automotive buying. Shipments of automotive material for new models is increasing. Miscellaneous bar users still account for most activity and purchases by farm implement manufacturers are steady.

Illinois Steel Co. has been awarded several hundred tons of bar steel for the bureau of supplies and accounts, navy department, Washington, for delivery at various east and west yards, bids June 25, schedule 5287.

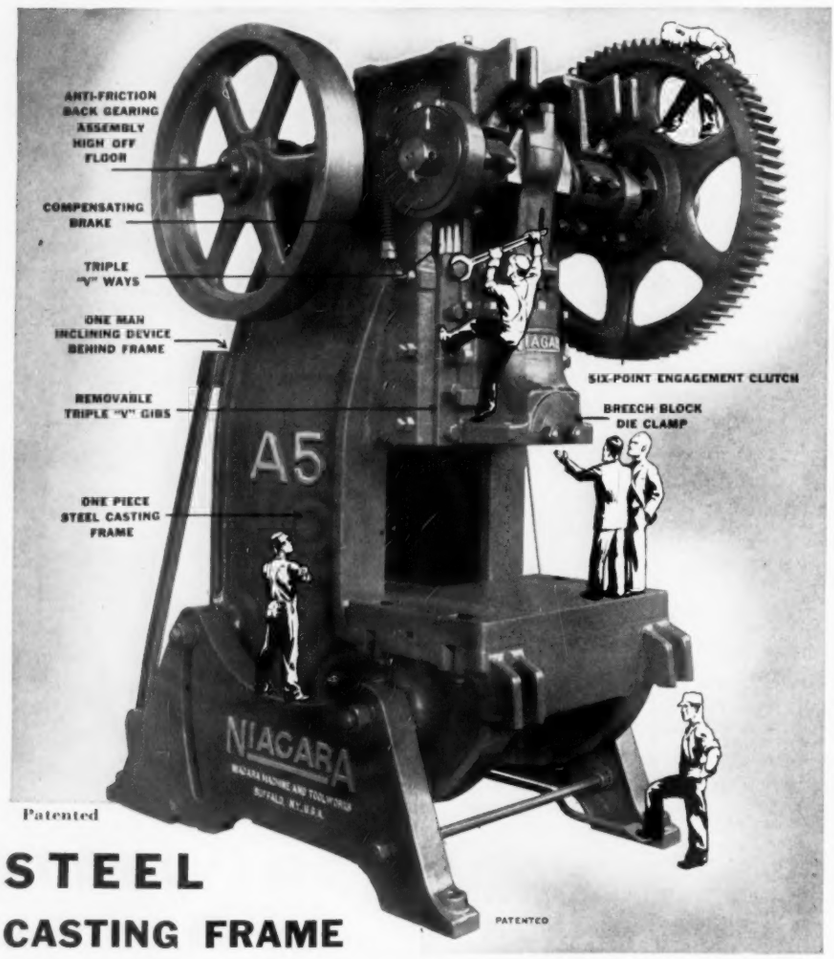
Boston—Commercial steel, forging and alloy bar specifications are steady, miscellaneous requirements being well spread, machine tool and screw machine product demand showing some improvement. Most users are buying as needed, placing little volume in advance. Prices are steady with revised extras now effective.

Crucible Steel Co. of America has been awarded 360 tons of nickel-steel bars for the Boston navy yard at 4.335c, delivered, bids July 23. All nine bidders for this contract quoted identical prices, the contract being awarded by lot this week.

New York—Steel bar tonnage is fairly sustained with no definite indication when producers will open books for fourth quarter.

Philadelphia—With the recently announced revisions in bar schedules, the trade is now taking it for granted there will be no further changes for fourth quarter. The latest change to affect bars was announced last week in connection with new prices on billets. Ludlum Steel Co., Watervliet, N. Y., was low bidder recently on approximately 150 tons of cold-finished bars for the Frankford arsenal, Frankford, Pa.

Youngstown, O.—Encouragingly re-



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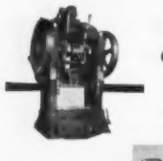

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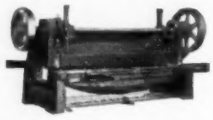

PRESSES NIAGARA SHEARS

sponsive acquiescense to the new steel bar card from both large and small steel bar users continues to be received by mills, indicating it is satisfactory generally to the trade. Demand for steel bars continues fair, from a constantly widening series of sources.

Plates

Plate Prices, Page 62

Pittsburgh — McClintic-Marshall Corp. has completed fabrication of seven needle flats for federal engineers at Cincinnati and Pittsburgh. Barging of petroleum from the south to the Pittsburgh district for distribution places several prospective barge orders nearer the contract stage. Plates remain quoted at 1.80c, Pittsburgh.

Cleveland—The market for moderate tonnages continues active, with small tank manufacturers and machinery builders leading in activity. A steady run of carload orders is noted for plates 3 to 6 inches thick for machine tool manufacture. Toledo, O., is negotiating for a $7,800,000 PWA loan with which to construct a fabricated water pipe line. Bids will be taken by Elyria, O., Sept. 5 on a 3½-mile fabricated water line and elevated water tank, requiring a substantial tonnage, variously esitmated. Plate prices are firm, and with most consumers prices appear secondary to delivery.

Chicago—Plate buying is light and construction work offers the largest prospective tonnages. Some shipments are being made to car builders but orders from this direction are few. Industrial tank work is slow to increase despite occasional gains in inquiries and municipal tank work also is slow.

Boston—In addition to navy contracts expected by three New England yards for warships included in the opening of Aug. 7, at least one, and probably two vessels are expected to be alloted to the Boston navy yard. Plates and other steel required for the latter will be bought by the navy direct. Pending tank needs are fairly large and miscellaneous plate buying is steady with a gradual uptrend. Prices are steady at 2.22c, Boston, and are expected to be reaffirmed this week for next quarter.

New York—Platemakers look for no change in prices for fourth quarter and indications are some may not open fourth quarter books until September. Buying is spotty with orders small but numerous. Old Dutch Brewers Inc., Brooklyn, N. Y., is reported to have placed 200 tons for tanks. Standard Oil of New Jersey, originally in the market for 5000 small tanks, has reduced its inquiry to 3100, requiring about 900 tons of plates. No awards on 13 navy vessels is expected for a week at least. It is unofficially reported the bids on an aircraft carrier and light cruiser exceeded the appropriation and new bids may be asked.

Philadelphia—Distribution is expected this week on approximately 12,000 tons of steel for two tankers to be built by the Sun Shipbuilding Co., Chester, Pa., for the Gulf Refining Co., Pittsburgh. Formal award of the construction contract was made last week. Early distribution of 1000 tons of plates, shapes and bars also is expected for the ferryboat for the Virginia Ferry Corp., subsidiary of the Pennsylvania railroad, recently awarded to the same yard. Steel is being purchased by the Parish Pressed Steel Co., Reading, Pa., for conversion of 100 box cars to automobile cars for the Reading Co. Indications are that plate prices will be reaffirmed for fourth quarter at 1.90c, Coatesville, or 1.99½c, Philadelphia.

San Francisco—Demand for plates is better than for several months. Bids have been taken on 750 tons for

NEW USES for PAGE STAINLESS STEEL WIRE

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There must be many ways in which the beauty-providing and corrosion-resisting properties of Page Stainless Steel Wire can be used in improving the appearance or adding to the strength and life of a product.

We want to know what these applications are and we will send—absolutely free—this Schick Injector Razor and 20 blades to everyone who takes the time to fill out the coupon below.

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the Cajalco reservoir, Los Angeles. Hamilton & Gleason Co., Denver, was low bidder on the general contract for the Fraser River dam siphon for Denver.

Seattle—New projects are beginning to develop but demand for heavy gages is not pronounced in this area. Light plates are moving in fair volume for repair jobs and general construction.

Contracts Placed

350 tons, 20 and 28-inch welded pipe line, Yellowstone park, to Steel Tank & Pipe Co., Portland, Oreg.

300 tons, four tanks for Sinclair Refining Co., West Haven, Conn., to Chicago Bridge & Iron Works, Chicago.

175 tons, bureau of supplies and accounts, navy department, Washington, for Brooklyn, N. Y., Philadelphia, and Charleston, S. C., delivery, to Carnegie Steel Co., Pittsburgh, at $9,-203.75; bids July 23, schedule 5595.

150 tons, tunnel forms, specification 1733, Los Angeles, to Western Pipe & Steel Co., San Francisco.

125 tons, 96-inch welded pipe, specification 1750, Los Angeles, to Consolidated Steel Corp., Los Angeles.

100 tons, tank for American Coal Co., Hartford, Conn., to Chicago Bridge & Iron Works, Chicago.

Contracts Pending

750 tons, Cajalco reservoir, Los Angeles; bids opened.

350 tons 24 and 36-inch pipe, Everett, Wash.; bids Aug. 19.

148 tons, Fraser dam siphon, Denver, Colo.; Hamilton & Gleason Co., Denver, low on general contract.

Unstated, tank work for relief lightship; bids by lighthouse department at Portland, Oreg., Aug. 19.

Unstated tonnage, single screw diesel electric-driven survey vessel, United States engineer, Portland, Oreg., Lake Washington Shipyards, Houghton, low, $177,000; bids July 30.

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Transportation

Track Material Prices, Page 63

Seaboard Air Line has divided an order for 12,000 tons of 100-pound rails equally between Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., and Bethlehem Steel Co., Bethlehem, Pa., for October delivery.

Arundel Corp., Baltimore, general contractor for relocating Wheeling & Lake Erie railroad tracks in the Muskingum conservancy district in Ohio, has awarded the Carnegie Steel Co. its rails, fastenings and other rolled steel requirements. As of last estimate this project requires 4968 tons of rails, 782 tons of tie plates, 173 tons of splice bars, and 117 tons of spikes.

Carnegie Steel Co., Pittsburgh, has completed rollings against several small orders recently received from the Nickel Plate, Pittsburgh & Lake Erie and other roads. Chicago rail mills are receiving some small rail orders but no large tonnages are pending.

Missouri Pacific has been authorized by the federal court to install air conditioning equipment in eight passenger cars in addition to the 169 already approved.

Car Orders Placed

Newfoundland Railways, 20 box cars, to Koppel Industrial Car & Equipment Co., Pittsburgh.

Reading Co., conversion of 100 box into automobile cars, to Parish Pressed Steel Co., Reading, Pa.

Rail Orders Placed

Arundel Corp., Baltimore, 4960 tons of rails for relocating Wheeling and Lake Erie tracks in Muskingum, O., district, to Carnegie Steel Co., Pittsburgh.

Seaboard Air Line, 12,000 tons, divided equally btween the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., and Bethlehem Steel Co., Bethlehem, Pa.

Buses Booked

American Car & Foundry Motors Co., New York: Five day coaches for Baltimore Transit Co., Baltimore.

White Motor Co., Cleveland; thirty 36-

passenger city coaches for DeCamp Coach Co., Staten Island, N. Y.; five 33-passenger city coaches for Middlesex & Boston Street Railway Co., Boston; seven 36-passenger city coaches for Garden State Lines Inc., Passaic, N. J.; six Indiana city coaches for Leavenworth Transportation Co., Leavenworth, Kans.

Sheets

Sheet Prices, Page 62

Pittsburgh—The market has lost some of July's briskness, although in rural buying of black and galvanized sheets there does not appear to be any interruption. Some of the market's declines are attributable to fewer of the so-called "miscellaneous" orders for sheets. Automobile buying of full-finished is in sufficient volume to engage the cold-rolling mills for four to six weeks hence and represents advance buying for fall assembly programs. The average of operations in black, galvanized and full-finished sheets is still between 60 and 65 per cent, with the rate for jobbing mills at 45 per cent. Nine bidders submitted identical figures on 400 tons of Ohio state license plate stock last week; the tenth being Reeves Mfg. Co. at a figure three mills less than the others.

Cleveland—Sheet mills now have larger order backlogs for automobile material, on which releases are expected in increasing volume late this month and in September. Some mills have been manufacturing these sheets in anticipation of specifications, accounting in a large measure for sustained operations. For some producers current releases were about 25 per cent of the tonnage booked during the week. Ford, Chevrolet and others are planning to make the best of the strong retail market for present models, and also to distribute new models before bad weather sets in, and from present appearances the change-over will be much shorter than the usual time. Washing machine and steel barrel manufacturers have increased the size of their orders, and miscellaneous demand is strong.

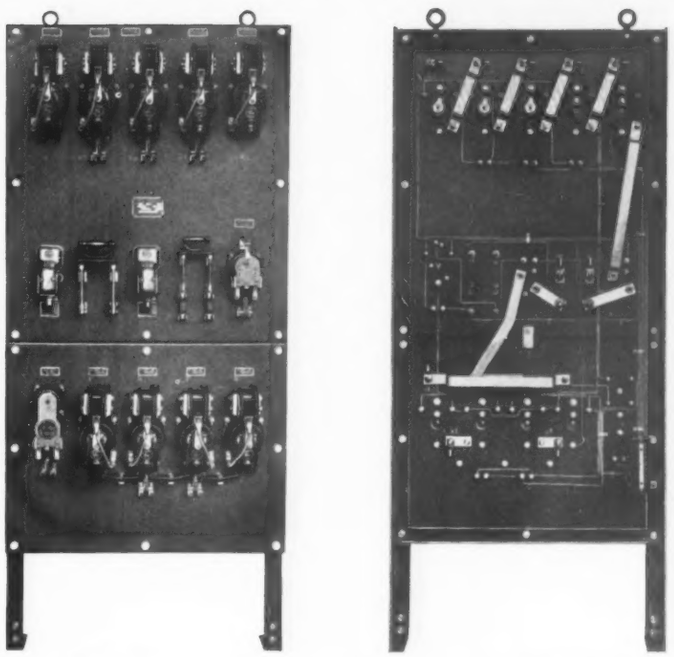
Chicago—Sheet demand is more active, aided by better automotive business. Producers anticipate expanding production of automotive material over coming weeks for new model requirements. Miscellaneous consumers contribute substantially to current bookings, with orders recently well maintained near the rate of the previous several weeks. Sheet prices are steady and expectations are for a continuation of present levels on fourth quarter business.

Boston—Small tank requirements continue outstanding in demand for sheets, with miscellaneous buying fairly well maintained. Lack of building still curtails demand for galvanized. Mill prices are expected to be reaffirmed this week.

New York—Sheet tonnage has slowed up markedly over the past week or so. Sentiment, however, continues strong and the general expectation is that September will see a good improvement. A factor at present undoubtedly is the large number of buyers away on vacations. The trade looks for prices generally to be reaffirmed for fourth quarter.

Philadelphia—Indications are that sheet sellers will shortly announce fourth quarter prices, practically unchanged from present levels. Autobody manufacturers in this district continue their efforts to obtain prices which would be at least on a parity with the Detroit delivered price. Reports that some concessions have recently been obtained cannot be confirmed and it is reliably understood that at least some autobody tonnage has been placed here recently at the firm market price. American Sheet & Tin Plate Co. has received an order for 250 tons of license tag stock from the state of Pennsylvania, on a drawing. Apollo Steel Co. received an

CLARK..
AUTOMATIC STEEL MILL CONTROL EQUIPMENT



Front and Rear Views of a Clark "3C" Standard Reversing Plugging Type of Magnetic Control Panel for the operation of the Bridge Motion of Electric Overhead Traveling Crane.
This panel is complete with Overload and Under-voltage Protection.
Note the extreme simplicity of the wiring on rear of panel due to the use of Clark's exclusive "Vari-Time" acceleration feature.

THE CLARK CONTROLLER CO.
1146 East 152nd St.
CLEVELAND, OHIO

order for 50 tons of galvanized-annealed sheets for the state. Demand so far this month appears to be a shade under the July rate.

Buffalo—District sheet mills continue to operate at 45 to 50 per cent. Construction of Bethlehem Steel Corp.'s new $20,000,000 sheet mill at Lackawanna has reached such a stage that it is now believed some hot metal may be put through at least a portion of the plant by Dec. 1.

Youngstown, O.—Improved demand for steel sheets and wide strip from the automotive industry, coming upon the increased inflow of orders for flat rolled products from miscellaneous sources, has been leading valley makers to expand their steelmaking facilities. Sheets continue to move into ever widening channels. The recently noted important order from Ford Motor Co., estimated variously at 80,000 to 120,000 tons, is understood to have been divided among these makers: Inland, Great Lakes, Empire, American Rolling Mill, Otis Steel, Allegheny Steel and American Sheet & Tin Plate Co., with small lots going to several other makers. The statement is made authoritatively that the Ford company paid the full market price on the usual base.

Cincinnati — Rolling schedules at district sheet mills are being held close to 60 per cent. Further automotive buying for third quarter, with the steady demand by other users, has developed a backlog assuring good September production.

St. Louis—Business of producers and distributors of steel sheets thus far in August is decidedly satisfactory. Miscellaneous requirements are accounting for the bulk of new orders, which are well diversified.

Birmingham, Ala.—Sheet production has taken on a little impetus and shipments also are more active. Sheet mills in this district have been making steady progress over a long period.

Behind the Scenes with STEEL

Telling the World

IF YOU read the financial pages of your Monday morning (or evening) newspaper, you usually will see in a prominent position STEEL's resume of the past week in the iron and steel markets. For many years this service has been sent every week to 350 leading newspapers throughout the country, nearly all of which use the review in full or in part. From time to time, special news releases are sent to the papers. These usually involve some expert interpretation of trends in the industry, not apparent to the casual observer. In fact, we have some of the most expert trend-interpreters in the business.

STEEL'S weekly index of steel production is watched closely by economists and business statisticians. When it's down, they turn bearish and when it's up they start breathing optimism. Everything's fine this week; the index (p. 12) is up 3 points.

* * *

Jiu-Jitsu

DOES everybody have the same trouble we experience in trying to read a newspaper on a streetcar, with the windows open? We have no trouble with the front page or the back page but when we start at the sport page, the funnies or Dorothy Dix's advice to the lovelorn we just get tied up into a knot.

One morning when trying to unearth the conclusion of a story on page 8 we wrestled with the sheet for about five blocks unsuccessfully; finally, angered to the core, we dug right in and after a few minutes' struggle ended up on the floor of the car with a fat woman's foot in one pocket and an umbrella in one ear. But, did we enjoy the rest of that story!

* * *

Saving a Sub

READERS wrote letters to the editor 50 years ago even as today. Here is one addressed to the editor of *Iron Trade Review* (now STEEL) and dated Aug. 26, 1885:

"If you have any good recipes for tempering springs or steel tools, I would like to hear from you. I think my subscription expires in September, and I wish to continue your paper as I like it very much.

H. Skinner

Did our editor reply? Quick as a flash, sensing a dying subscription. A good "recipe," it seemed, was to "harden the article by heating it gradually to a bright red, and then plunge it into cold water; it is then tempered by being warmed gradually and equably, either over a fire, or on a piece of heated metal, until it becomes a brown yellow, slightly tinged with purple, when it is again plunged into water."

This "recipe" was guaranteed to turn out good hatchets, chipping chisels or saws.

* * *

Phoenicopteridae

THAT camera study of a malleable iron flamingo which the Lake City Malleable Co. had on the back cover of STEEL for July 29 stirred us into wondering about haunts and habits of the flamingo. Not that it makes any real difference, but we find that flamingos are "gregarious, breeding in colonies and building nests of mud in swamps and shallow lagoons, laying but one or two eggs. The flamingos constitute a family, Phoenicopteridae, and a suborder or order, Odontoglossae."

We have a couple of the malleable

iron variety on our desk (the Lake City company will send you one upon request) where, ungregariously, they pine away, refusing to breed, refusing to build nests of mud, denying us the privilege of even one little egg. One day recently we colored their eyes red and they seemed to feel a lot better after that.

* * *

A Note

ONE of our Pittsburgh readers, apparently suffering slightly from the current New Dealerium, sends in his check for $6 for a subscription to STEEL for two years, with a notation, "and who knows what you will be printing then—mebby 10-cent dollars." Buck up, friend, when we start printing 10-cent dollars we'll save a bundle for you, with our compliments.

—SHRDLU

Pipe

Pipe Prices, Page 63

Pittsburgh — Bids will be taken Aug. 27 at the Zanesville, O., army engineer's office on 7600 feet of 13 to 20-inch diameter steel pipe. Material will be used for the rebuilding of eight sections of existing gas lines incidental to the construction of the Dover-Bolivar reservoirs in the Muskingum, O., district. The oil country and railroad industries are all taking increased amounts of tubular products for immediate shipment, whereas the automotive industry has been a heavy buyer, but for delayed shipment. Discounts on all tubular products are firm and without change.

Chicago—Cast pipe awards are small and inquiries usually are limited to lots of only a few hundred tons. Numerous municipalities have work under consideration which in the aggregate will take a substantial pipe tonnage, but there is no assurance that government financing will be forthcoming in sufficient time to start work before fall or winter. Saginaw, Mich., is in the market for 180 tons. Chicago shortly will close on 1595 tons.

Boston — Cast pipe buying and inquiry are light, the most promising water line extension projects being held up by delays in federal financial assistance. Small tonnages have been purchased by Newburyport, Mass., and New London, Conn., the former likely to take more than first specified. Merchant steel pipe buying is steady, but not heavy, in small lots.

New York—Cast pipe buying continues largely for fill-in lots with inquiry light. Baltimore has bids on over 1000 tons, the largest pending inquiry in the East.

San Francisco — Activity in cast pipe on the Pacific coast is by no

means pronounced. The only large award involved 650 tons of 6 and 20-inch pipe for Roseville, Calif., booked by United States Pipe & Foundry Co. Bids have been taken on 1995 tons for San Francisco. The only new inquiry of importance calls for 1812 tons of 12, 14 and 18-inch pipe for Price, Utah, bids on which have just been opened.

Seattle — Demand for cast pipe is inactive but important projects are proposed and should be up for figures soon. Portland, Oreg., opened bids for 6, 8 and 30-inch, 200 tons, on which United States Pipe & Foundry Co. is low. Olympia, Wash., is trying to finance a $25,000 project to replace wood mains with cast iron. Seattle water department plans ten large improvements contingent on federal aid. Spokane is preparing plans for a pumping station and mains to cost $330,000, work to start within 90 days. Montana applications for federal loans and grants include $67,771 for a new water system for Thompson Falls.

Cast Pipe Placed

650 tons, 6 and 20-inch, Roseville, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

Cast Pipe Pending

1995 tons, 6 and 8-inch, San Francisco; bids in.

1812 tons, 12, 14 and 18-inch, Price, Utah; bids in.

1200 tons, pipe and fittings, Baltimore; United States Pipe & Foundry Co., Burlington, N. J., low.

950 tons, 12 and 18-inch, Nashville, Tenn.; bids Aug. 27.

260 tons, 8-inch and under, Perry, Mo.; bids Aug. 22; also 75,000-gallon steel tank on 110-foot tower, W. B. Rollins & Co., Kansas City, Mo., engineer.

235 tons, 6-inch, with fittings, Massapequa, N. Y.; bids Aug. 26.

200 tons, 12-inch, class B, bell and spigot, county board, Arlington county, Clarendon, Va.; bids Sept. 11, contract 21, the J. N. Chester Engineers, Rosslyn, Va.

200 tons, 6, 8 and 30-inch, Portland, Oreg.; bids in.

180 tons, various sizes, Saginaw, Mich.; bids Aug. 20.

115 tons, 6 and 10-inch, Panama; bids Aug. 26, schedule 3080, general purchasing officer, Washington.

Steel Pipe Pending

Unstated tonnage, 58,100 feet, small sizes, standard galvanized steel pipe, including 30,000 feet of 2-inch and 20,000 feet of 1-inch, Panama; bids Aug. 26, schedule 3080, general purchasing office, Washington.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 63

Bolt, nut and rivet manufacturers still are unable to build backlogs. Orders are still up to the July showing in number and size. The base of 2.90c, Pittsburgh and Cleveland, 3.00c Chicago, on large rivets is unchanged and the market on bolts and nuts is 70, 10 and 5 off list. Small rivets are 70 and 5 off.

At Cleveland heavy orders for nuts and bolts are being received from automobile manufacturers, with instructions to make them up and hold for releases over the next 30 to 60 days. Demand from implement manufacturers is steady but railroad buying is comparatively light.

So sharp has been the drop in bolt and nut prices recently that on 90 tons of 1-inch bolts for public work at New York the delivered price per 100 pounds came within 11 cents of the delivered New York price for commercial steel bars. The figure was $2.26, against $2.15 for commercial bars. The bid was made by J. K. Larkin & Co., New York. Significant of the spread in prices, the Larkin company's total bid was $4251, against the high bid of $7954 submitted by the Pittsburgh Screw & Bolt Corp. The buyer was the procurement division of the United States treasury for emergency relief work on Staten island.

This opening follows by a few days the award of two carlots of 1-inch

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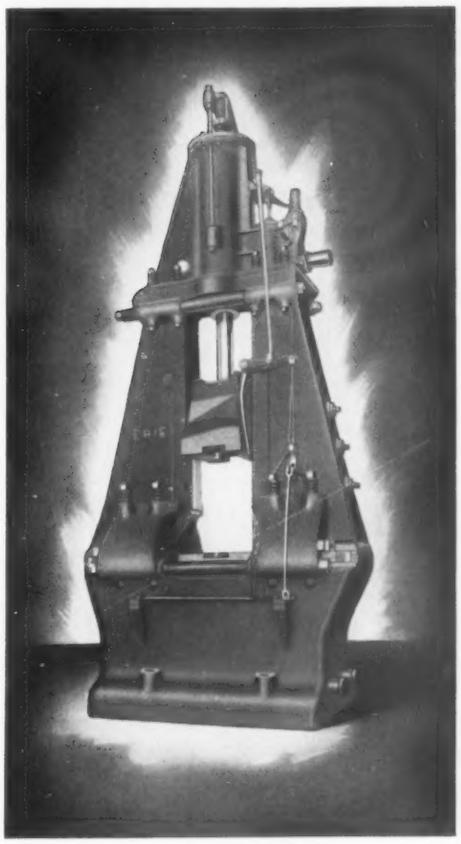

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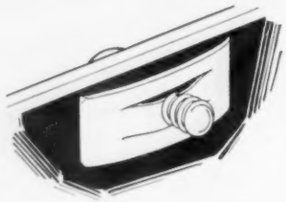

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Tinnerman Stove & Range Co.

Speed Nut Division
Cleveland, Ohio

bolts by New York for dock work to J. C. Mac Elroy & Co., New York, at about $2.50 per 100 pounds, well under the quoted market.

Shapes

Structural Shape Prices, Page 62

New York—Structural steel projects are slightly more numerous, although large individual projects are few, there being but five active taking more than 1000 tons, bids closing this week on the Bronx postoffice, 2000 tons. American Bridge Co. is low on 750 tons for grade crossings at Staten Island, N. Y. The aggregate volume placed in this immediate district is light. A few of the smaller fabricating shops are slightly more active.

Philadelphia — Lehigh Structural Steel Co.'s order for 12,000 tons for the department of interior building, Washington, is one of the largest to have been booked by a district fabricator in some time. Several fair size tonnages are pending, including 2300 tons for the addition to the Archives building in Washington, on which McCloskey & Co., Philadelphia, are the low bidders. Shape prices are expected to be reaffirmed this week for fourth quarter at 1.90c, Bethlehem, Pa., or 2.01½c, Philadelpia.

Thomas Earle & Sons, Philadelphia, have been awarded the formal contract for installing 2600 tons steel piling in the harbor at Wilmington, Del., for the United States engineer, Philadelphia.

Pennsylvania railroad may resume electrification work around Newark, N. J., with the possibility that several thousand tons of steel against old orders will be released over the remainder of the year. New Jersey expects to have plans completed by Sept. 1 for approximately 145 shore protection projects, most of which will require steel piling. Government aid will be asked.

Pittsburgh—Although structural shape inquiry is less, bids will be accepted Aug. 28 by the Allegheny county authority on the 7200-ton Homestead toll bridge at Pittsburgh and the 750-ton Liberty Tube plaza. The 1500-ton state highway bridge for Fifth street, Parkersburg, W. Va., involving a 350-foot truss span has been awarded to McClintic-Marshall Corp. Nicholas Construction Co., Philadelphia, is low on the Wheeling, W. Va., post office and bids have been received on the 500-ton bridge at Campbell, O., for the Pittsburgh & Lake Erie railroad. Plain structural shapes are 1.80c, base, Pittsburgh, with no early change contemplated.

Cleveland — United States engineers have asked for an additional $14,000,000 grant for six more dams and track relocations in the Muskingum, Ohio, conservancy district in the Massillon area, where recent floods did considerable damage. If authorized this will require a substantial tonnage of structural steel. Bids are being taken on 275 tons for a factory building for the Owens-Illinois Glass Co., at Terre Haute, Ind., and on 250 tons for a cafeteria in Toledo, O.

Chicago—Awards are lighter, due to the absence of bookings of material for Mississippi river locks and dams. S. A. Healy Co. is low bidder for the general contract for the Burlington, Iowa, dam, involving 5900 tons of fabricated steel and piling, with American Bridge Co. named to furnish the former. Action is awaited on the part of Illinois to commence work on proposed grade crossing elimination and other highway work as part of the federal work relief program.

Boston—Structural volume placed is light, about 400 tons, but New England shops have been more successful in securing recent contracts. As a result fabricating is more active in at least two plants. Pending bridge projects are few, and, as in the case of other needs expected under the PWA program, work planned is slow in reaching the bidding stage.

St. Louis—Despite the booking of a number of small orders, the seven large structural steel fabricating plants here have reduced their operations to an average of 25 per cent. The reason is the holding up of orders, due to labor troubles and other causes. Recently the Missouri highway commission rejected bids for highway bridges which would have absorbed over 1000 tons of steel.

Birmingham, Ala.—While recent contracts have been small, several federal projects are coming to a head which will call for considerable material. Alabama highway commission will release orders for about 500 tons this week.

San Francisco — The structural shape market was the most active of any week so far this year. Pacific

Shape Awards Compared

	Tons
Week ended Aug. 17	27,001
Week ended Aug. 10	21,260
Week ended Aug. 3	14,400
This week, 1934	12,692
Weekly average, 1934	16,284
Weekly average, 1935	15,026
Weekly average, July	15,240
Total to date, 1934	590,861
Total to date, 1935	510,888

Coast Steel Corp. took 1000 tons for the mint in San Francisco and 350 tons for a post office in San Pedro, Calif.

Seattle—While many new projects are proposed, they are not definite. In the meantime no specifications of importance are before fabricating estimators. Awards of the last month are well in advance of the corresponding period last year. The largest award of the week went to Isaacson Iron Works, Seattle, 300 tons for the Weyerhaeuser pulp mill structures at Everett, Wash.

Shape Contracts Placed

12,000 tons, department of interior building, Washington, through the George A. Fuller Co., that city, to Lehigh Structural Steel Co., Allentown, Pa.; 3500 tons of rail steel bars for this project went to the Sweets Steel Co., Williamsport, Pa.

2600 tons, piling, harbor work, Wilmington, Del., formal contract awarded through United States engineer, Philadelphia, to Thomas Earle & Sons, Philadelphia.

1500 tons, state highway bridge over Fifth street, Parkersburg, W. Va., to McClintic-Marshall Corp., Bethlehem, Pa.

1270 tons, jail, Bronx county, New York, to Harris Structural Steel Co., New York; through George F. Driscoll Co.

1000 tons, mint, San Francisco, to Pacific Coast Steel Corp., San Francisco.

800 tons, high school, Kansas City, Kans., to Kansas City Structural Steel Co., Kansas City, Mo.

750 tons, grade crossings, Staten Island Rapid Transit Co., Elm Park and Mariners Harbor, Staten Island, N. Y., to American Bridge Co., Pittsburgh. Formal award subject to approval of transit commission and state engineer (PWA). Bids taken direct on steel Aug. 12.

750 tons, Wheeler power plant, Tennessee river, 16 miles from Wilson dam, Alabama, Tennessee valley authority, to Wisconsin Bridge Co., Milwaukee; bids Aug. 5 on steel direct.

650 tons, plant addition, General American Tank Car Corp., East Chicago, Ind., to unstated fabricator.

460 tons, roller gates, dam, Yuma, Ariz., for United States bureau of reclamation, to Dravo Contracting Co., Pittsburgh.

390 tons, state highway bridge, Flackville, Ind., to McClintic-Marshall Corp., Bethlehem, Pa.

360 tons, alterations to Knoxville junior high school, Pittsburgh, to Keystone Engineering Co., Pittsburgh, through Davis Construction Co., Pittsburgh, general contractor.

350 tons, auditorium, Fresno, Calif., to Minneapolis-Moline Power Implement Co., Minneapolis.

350 tons, postoffice, San Pedro, Calif., to Pacific Coast Steel Corp., San Francisco.

330 tons, bridge, Central Railroad of New Jersy, Raritan, N. J., to Phoenix Bridge Co., Phoenixville, Pa.

300 tons, bridge, Florence, Ala., to Virginia Bridge & Iron Co., Roanoke, Va.

300 tons, pulp plant structures, Everett, Wash., Weyerhaeuser Timber Co., to Isaacson Iron Works, Seattle.

275 tons, bridge, McCall, Idaho, to Virginia Bridge & Iron Co. Roanoke, Va.

270 tons, high school, Anaheim, Calif., to Minneapolis-Moline Power Implement Co., Minneapolis.

250 tons, piling, lock No. 14, Le Clair, Iowa, to Inland Steel Co., Chicago.

240 tons, warehouse, Des Moines, Iowa, for General Motors Corp., Detroit, to Pittsburgh-Des Moines Steel Co., Des Moines, Iowa.

210 tons, 146-foot truss span, Missouri Pacific railroad, Gasconade, Mo., to Virginia Bridge & Iron Co., Birmingham, Ala.

200 tons, bridge, Wickerburg, Ariz., to Pacific Coast Steel Corp., San Francisco.

180 tons, furnace steel, Beaumont, Tex., to Jones & Laughlin Steel Corp., Pittsburgh; through M. W. Kellogg Co.

170 tons, state highway bridge, Wellsburg, W. Va., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

160 tons, two state highway bridges, Andover and Brownville, Me., to Berlin Construction Co., Berlin, Conn.

155 tons, floors, building, International Harvester Co., Springfield, Ill., to Berger Iron Works, Canton, O.

130 tons, Southwick Memorial, Burlington, Vt., to Vermont Structural Steel Co. Inc., Burlington, Vt.

130 tons, postoffice, Somerville, Mass., to Boston Bridge Works Inc., Cambridge, Mass.; Edmund J. Rappoli, Cambridge, general contractor at $142,900.

116 tons, postoffice, Far Rockaway, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.; through Silberblatt & Lasker Inc.

115 tons, addition to factory, Electrolux

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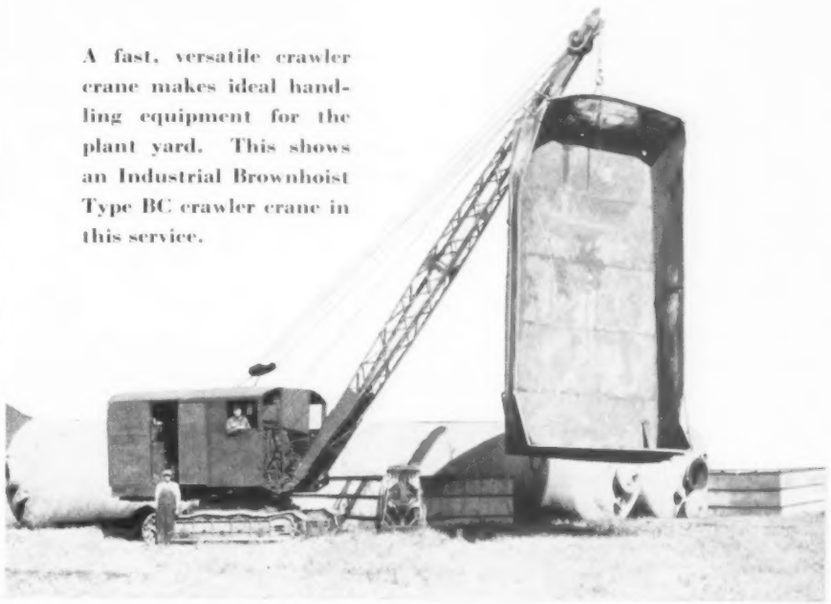

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INDUSTRIAL BROWNHOIST

Co., Old Greenwich, Conn., to Rogers Structural Steel Co., Corry, Pa.; through H. K. Ferguson Co.

110 tons, highway, bridge, Dartmouth, Mass., to Boston Bridge Works Inc., Boston.

Shape Contracts Pending

7200 tons, Homestead toll bridge, Pittsburgh, contract No. 202, for Allegheny county authority, Pittsburgh; bids Aug. 28.

5900 tons, including 2600 tons of piling, dam No. 18, Burlington, Iowa; S. A. Healy Co., Chicago, low for general contract. American Bridge Co., Pittsburgh, low for fabricated steel.

4000 tons, estimated, federal court house, Philadelphia, project approved with construction not to be undertaken for some time, however.

2500 tons, addition, Archives building, Washington, McCloskey & Co., Philadelphia, low, bids Aug. 13; George A. Fuller Co., second. Westinghouse Electric Elevator Co., Chicago, low on elevator plant, $31,840.

1000 tons, estimated, custom house, Denver; United States Fireproofing Co., Chicago low.

1000 tons, incinerator, Fifty-sixth street and Twelfth avenue, New York; Rosoff Bros., New York, low, $1,102,000, bids Aug. 13, department of sanitation, New York.

1000 tons, High street bridge, Oakland, Calif.; plans being prepared.

800 tons, postoffice, Atlantic City, N. J.; D. M. W. Contracting Co., Brooklyn, N. Y., low for general contract.

750 tons, Liberty Tubes plaza project, contract No. 101, A, B and C, for Allegheny county authority, Pittsburgh; bids Aug. 28.

635 tons, transmission tower and substation, specification 634, Boulder dam, Nevada; American Bridge Co., Pittsburgh, low.

592 tons, desilting works, All-American Canal System, Yuma, Ariz.; general contract to Dorr Co. Inc., New York, at $564,800.

500 tons, court house, Austin, Tex.; Algernon Blair, Montgomery, Ala., low for general contract.

500 tons, buildings and connecting bridges, department of agriculture, Washington; Viking Construction Co., New York, low, bids Aug. 13.

500 tons, Pittsburgh & Lake Erie railroad bridge, Campbell, O.; bids received.

500 tons, postoffice, Wheeling, W. Va.; Nicholas Construction Co., Philadelphia, low on general contract bids of Aug. 12.

360 tons, Twenty-ninth street bridge, Huntingdon, W. Va., for state highway department; bids Aug. 20.

350 tons, addition, postoffice and court house, Huntington, W. Va., James I. Barnes, Logansport, Ind., low; bids Aug. 13. Westbrook Elevator Mfg. Co. Inc., Danville, Va., low on elevator plant, $24,800.

350 tons, bridges, Nebraska, for Chicago, Burlington & Quincy railroad.

275 tons, factory building, Owens-Illinois Glass Co., Terre Haute, Ind.

250 tons, federal depository building, Fort Knox, Ky.

225 tons, state highway bridge, Bronx county, New York, De Christopher Bros., Peekskill, N. Y., low, $126,666.50; bids Aug. 13.

200 tons, buildings, McKees Rocks, Pa., for Socony Vacuum Oil Co., Philadelphia.

200 tons, bridge, Atlantic county, New Jersey; Eastern Engineering Co., Atlantic City, N. J., awarded general contract.

185 tons, postal station "H", New York; bids Sept. 9.

175 tons, also 35 tons liner plates, Island Park dam project, Idaho; Max Kuney Co., Spokane, Wash., low.

160 tons, steel piling, bridge pier reinforcement, Upper Black Eddy, Pa.; Carl Camp, Philadelphia, low on general contract.

150 tons, library and administration building, state college, Kingston, R. I.; Rowley Construction Co., Pawtucket, R. I., low, $191,700.

150 tons, shapes and bars, postoffice, St. Albans, Vt.; bids Sept. 5.

150 tons, state highway bridges, New York; bids Sept. 4.

120 tons, shapes and bars, postoffice, Torrington, Conn.; bids Sept. 5.

110 tons, boardwalk, south and midland beach, Staten Island, N. Y.; WPA project, city purchasing materials.

110 tons, building, St. Joseph's academy, Dunkirk, N. Y.; Meister Contracting Co., Dunkirk, low.

101 tons, three state bridges in Crook, Laramie and Sublette counties, Wyoming; bids Aug. 20.

100 tons, addition to state hospital, Massillon, O.

100 tons, shapes and bars, two state bridges, Mill river, Hamden, Conn.; Smith Construction Co., Derby, Conn., general contractor.

100 tons, postal station "X", New York, Albert Development Corp., Bronx, N. Y., low, bids Aug. 13.

100 tons, angles, channels, I-beams and plates, Panama; bids Aug. 26, schedule 3080, general purchasing officer, Washington.

Unstated tonnage, six more dams and track relocations in the Massillon area of Muskingum, Ohio, conservancy district; $14,000,000 asked by government engineer.

Unstated, railroad work and trestle, Fort Peck, Mont., project; Morrison-Knudsen Co., Boise, Idaho, low.

Unstated, 135-foot span, Bitterroot river, Montana; James Sten, Hamilton, Mont., general contractor.

Unstated, gates, hoists and miscellaneous, for Pine View project, Utah, and Rye Patch dam, Nevada; bids to bureau of reclamation at Denver, Aug. 26 and Aug. 28 respectively.

Unstated, span Newaukum river, Washington, for Cowlitz, Chehalis & Cascade railroad; plans in preparation.

Unstated, overhead crossing, The Dalles, Oreg., for state highway commission; bids soon.

Unstated tonnage, transmission towers and switchyard structures, circuits 2, 4 and 5, specification 634, Boulder power plant, Colo., McClintic-Marshall Corp., Bethlehem, Pa., low, $57,250; bids Aug. 2, bureau of reclamation, Denver.

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Quicksilver

New York—Quicksilver prices are unchanged in a quiet market. Round lots of 100 virgin flasks are quoted $69 a flask, with bids of $68.50 for large lots reported refused, and small lots held at $71 a flask.

Reinforcing

Reinforcing Bar Prices, Page 63

New York—Reinforcing steel inquiry is heavier, especially highway mesh for New York state, while additional volume is out for New Jersey where close to 450 tons are pending for roads and bridges. General contractors on district projects have close to 4500 tons of bars to place, with early action expected on a good part of the tonnage. Prices are steadier.

A sharp increase is noted in mesh requirements in New York state, with opening of bids Sept. 4 on 1600 tons. Tonnage will be sustained by other openings on Sept. 10, and every week following for a month or more. To apply against highway contracts for which specifications are complete $27,000,000 is available, and $11,000,000 for early grade crossing work.

Philadelphia—Award of 3500 tons of rail steel bars for the department of interior building to the Sweets Steel Co., Williamsport, Pa., features the reinforcing bar market. An additional quantity of steel bars for this project may be placed later, it is said. Several smaller tonnages are active including 250 tons for New Jersey state road work in Burlington county. This is the first important road job to be noted in this district in many weeks. Billet steel bars, cut lengths, are unchanged at 2.05c, Pittsburgh, or 2.36c, Philadelphia.

Pennsylvania is expected to inquire soon for 200 miles of concrete roadwork.

Pittsburgh—The market on new billet steel bars for reinforcing purposes remains 2.05c, base Pittsburgh, although application of bending and engineering extras is irregular pending a revision to be announced generally. About 1000 tons of reinforcing steel bars are involved in readvertisement of bids Aug. 28 by the Allegheny county authority for contracts No. 101, A, B, and C for the Liberty Tubes plaza. Dravo Construction Co. is reported to have placed about 500 tons of bars for the Winfield, W. Va., dam, and Arthur G. McKee Co., Cleveland, has the general contract for building an oil-distribution system at McKees Rocks, Pa., for the Socony-Vacuum Oil Co., which will require several hundred tons of bars.

Cleveland—For the Whisky Island and the Outhwaite federal housing projects here about 1000 tons of reinforcing bars, each, will be required. A difficulty over wage rates to be paid has resulted in rejecting bids on the Outhwaite project and a call for new bids Aug. 29. Bids on the Whisky Island project also are expected about that time. Additional orders have been placed for the Muskingum, Ohio, conservancy district, amounting to about 325 tons. The market for small lots is fairly active.

Chicago—Most activity in concrete bars is confined to small private projects involving individual lots of less than 50 tons. Such work is fairly active. Largest tonnages pending are for Mississippi river locks and dams, the latest of these on which bids have been opened being dam No. 18, Burlington, Iowa, involving 1250 tons. While substantial bar tonnages will be required for road work and grade crossing elimination in Illinois, inquiries for this program have yet to be issued. Distributors' prices are moderately steadier.

Boston—Active projects taking reinforcing steel are few. Highway and bridge demand has been disappointing, with indications of little early improvement. Providence Iron & Steel Co. booked both bars and shapes for a 3-story hospital addition, Burrillville, R. I.

San Francisco—Awards of reinforcing bars were the largest for any week in over a month and aggregated 2520 tons, bringing the total for the year to 77,069 tons as compared with 69,363 tons for the corresponding period in 1934. Soule Steel Co. booked 801 tons for a conduit in Los Angeles county and Blue Diamond Corp. secured 506 tons for another conduit for the county. Soule Steel Co. is low bidder on 1131 tons for the mint, San Francisco.

Seattle—While there is a fair number of small tonages, large projects are lacking. Demand from private industry is at a minimum. Building construction is improving but has not attained sufficient volume to affect the market.

Reinforcing Steel Awards

3500 tons, department of interior building, Washington, awarded through the George A. Fuller Co., that city, to the

Concrete Awards Compared

	Tons
Week ended Aug. 17	7,382
Week ended Aug. 10	2,689
Week ended Aug. 3	2,502
This week in 1934	757
Weekly average, 1934	4,084
Weekly average, 1935	4,320
Weekly average, July	2,225
Total to date, 1934	147,190
Total to date, 1935	146,889

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New York, Philadelphia, Cleveland, Detroit, Chicago.

Sweets Steel Co., Williamsport, Pa.

1050 tons, sewage plant unit No. 4, Blue Plains, Washington, to Hudson Supply Co., Washington; through Charles H. Tompkins Co.

801 tons, Hall's canyon conduit for Los Angeles county, California, to Soule Steel Co., Los Angeles.

506 tons, Verdugo wash conduit for Los Angeles county, California, to Blue Diamond Corp., Los Angeles.

350 tons, store for W. & J. Sloane, Beverly Hills, Calif., to unnamed interest.

325 tons, relocating tracks at Beach City and Mills Creek, O., for Muskingum, Ohio, conservancy district project, to Kalman Steel Corp., Bethlehem, Pa.

250 tons, city hall, El Monte, Calif., to Blue Diamond Corp., Los Angeles.

150 tons, postoffice, San Pedro, Calif., to unnamed interest.

150 tons, school, Van Nuys, Calif., to unnamed interest.

100 tons, postoffice, Flagstaff, Ariz., to unnamed interest.

100 tons, Seattle sewer project and state work, to Northwest Steel Rolling Mills Inc., Seattle.

100 tons, bridge, Twin Falls, Idaho, to unnamed interests; William Hoops, Twin Falls, general contractor.

Unstated tonnage, 3-story hospital addition, Wallum Lake sanatorium, Burrillville, R. I., to Providence Steel & Iron Co., Providence, R. I.; E. Turgeon, Providence, general contractor.

Reinforcing Steel Pending

5125 tons, Cajalco dam and dike, metropolitan water district, Los Angeles, placing only; bids opened.

1250 tons, dam No. 18, Burlington, Iowa; S. A. Healy Co., Chicago, low for general contract.

1131 tons, mint, San Francisco; Soule Steel Co., San Francisco, low.

1000 tons, contracts No. 101, A, B and C, for the Liberty Tube plaza, Pittsburgh, bids to Allegheny county authority Aug. 28.

1000 tons, Outhwaite housing project, Cleveland; bids rejected and readvertised for Aug. 29.

1600 tons, mesh, state highways, New York; bids Sept. 4.

460 tons, highways and bridges, Texas; bids Aug. 20, state highway commission, Austin, Tex.

450 tons, addition to Archives building, Washington; McCloskey & Co., Philadelphia, low bidders.

400 tons, boardwalk, south and midland beach, Staten Island, N. Y.; WPA project, city purchasing materials.

300 tons, incinerator, New York, Roseoff Bros., New York, low.

275 tons, mesh, state highway, Oneida county, New York; Davis & Stern Inc., Whitney Point, N. Y., low, $316,187.10, bids Aug. 13.

220 tons, highway, route S-40, section 4, from route 40 to Butlers Place, Burlington county, New Jersey; bids Sept. 3 to E. Donald Sterner, state highway commissioner, Trenton, N. J.

175 tons, Island Park dam project, Idaho; Max Kuney Co., Spokane, low.

170 tons, Uncompahgre project, Colorado; bids in.

135 tons, bridge pier reinforcement, Upper Black Eddy, Pa.; Carl Camp, Philadelphia, low on general contract; approximately 160 tons of piling also will be required.

132 tons, state highway work in four counties, Wyoming; bids Aug. 20.

125 tons, postoffice, Atlantic City, N. J.; D. M. W. Contracting Co. Inc., Brooklyn, N. Y., low for general contract.

115 tons, state bridge, Atlantic county, New Jersey; Eastern Engineering Co., Atlantic City, awarded general contract.

105 tons, Kappock street bridge, Henry Hudson Parkway, New York; bids Aug. 6.

10 tons, highway, Plymouth, Conn.; bids Aug. 26.

Unstated, Sun river project, Montana; Martin Wunderlich, Jefferson City, Mo., low.

Unstated tonnage, estimated at several hundred tons, Socony Vacuum Oil Co. distribution station, McKees Rocks, Pa.; Arhur G. McKee, Cleveland, general contractor.

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Wire

Wire Prices, Page 63

Pittsburgh—American Steel & Wire Co. and other producers are announcing a new system of quoting wire products, based primarily on a quantity differential plan. On nails, for example, base will be 40,000 pounds and over with 5c extra for 20,000 to 39,999 pounds; 10c extra for 10,000 to 19,999 pounds, and 15c extra for 5000 to 9999 pounds. Less than 5000 pounds will take 20c up. A similar method of quoting will apply for barbed wire and barbless wire, woven wire, bale ties, staples, and annealed and galvanized wire.

No change has been made, nor is one immediately contemplated, for manufacturing wire items, and the market is quoted at 2.30c, base Pittsburgh, on plain manufacturer's wire and 2.90c, Pittsburgh, on spring wire.

Cleveland—The market for wire and wire products is strong, demand for manufacturers wire showing further improvement. Leading sellers here have not received instructions regarding the proposed system of quantity differentials on merchant wire. It is understood these still are under consideration.

Chicago—Wire demand is steady, with prospects favorable for a gain during the next several weeks. Miscellaneous consumers show no slackening in requirements and shipments to the automotive industry are expected to increase soon. Merchant products are fairly active with better consumer buying in farm districts anticipated during late summer and early fall.

Boston—A slightly broader demand for wire products with specialty and manufacturers' wire buying well maintained has resulted in a gain of several points in finishing mill operations. Rope and cable inquiry is slightly improved, but heavier products continue to lag.

Philadelphia—A change shortly in the price of wire nails is indicated. While no definite change in schedule has yet been announced, it is understood that the base price may be reduced 10 cents, with quantity extras fixed for small lots. Business in wire products is not as active as a month ago, but is nevertheless holding up fairly well, with agricultural requirements outstanding.

Washington—Prices were uniform on several thousand tons of cable, one of the largest inquiries by the navy department in months, bids Aug. 13. Material is for practically all navy yards. All bidders quoted identical prices. Close to $750,000 is the cost of the purchase. Practically all types of cable are included.

Youngstown, O.—Demand for manufacturers' wire seems to be

widening as various lines for further manufacture look to this product as their raw product.

Strip Steel

Strip Prices, Page 63

Pittsburgh—Strip steel buying by the automotive trade has been heavy but few shipping releases have been given. One important strip user last week broke the ice to an extent when it issued orders permitting shipments against its orders on and after Sept. 3. Base prices on strip steel are firm at 1.85c, Pittsburgh, on hot-rolled and 2.60c, Cleveland or Pittsburgh, for cold-rolled.

Cleveland—General Motors partsmakers have placed additional substantial orders for strip steel, with immediate shipment requested in some instances. Improvement is noted in miscellaneous orders. The Cleveland wide strip mills last week operated at capacity.

Chicago—Automotive strip demand is slightly more active and an early increase in shipments is expected for new model production. Demand otherwise is widely scattered, with diversification of buying an important factor in maintaining total business near the rate of the previous several weeks. Forward commitments are limited, with consumer stocks relatively light. Present prices are expected to be extended into fourth quarter.

Boston—Cold strip buying improves slowly, although the upturn has been steady for the last week or two. Consumer demand is well spread and miscellaneous requirements lead. Range builders are taking fair shipments. Slightly more strip is being released for automobile accessories. Shipments are generally small, but fairly numerous. No change in prices is expected next quarter.

New York—Miscellaneous requirements continue to sustain cold-rolled strip business here. Sellers report little variation so far this month. Buying by automobile accessory manufacturers is expected to increase tonnage soon.

Philadelphia—Strip tonnage is moving slowly. Radio manufacturers are expected to be increasingly good buyers. Prices are steady, with hot-finished at 1.85c, Pittsburgh, or 2.16c, Philadelphia and cold-finished at 2.60c, or 2.91c, Philadelphia.

Cold Finished

Cold Finished Prices, Page 63

Pittsburgh—Increased buying from automobile manufacturers is leading to a better market for both carbon and alloy cold-finished bars. Considerably more tonnage than is now being shipped is waiting release through September. Certain base size changes are in contemplation on cold-drawn bars as a result of changes in hot-rolled bar size extras. Cold drawn is quoted at 1.95c, base, Pittsburgh.

Pig Iron

Pig Iron Prices, Page 64

Pittsburgh—Carload requirements of district melters constitute the largest share of the present market with no large basic or bessemer iron tonnage requirements in prospect. Little consideration has been given to fourth quarter pig iron prices and the market is steady at $18, Pittsburgh district furnace, for basic; $18.50 for foundry grades, and $19 for bessemer.

Cleveland—Spot demand for pig iron is strong, tonnage booked so far this month being about 20 per cent larger than in the comparable period in July. A lake merchant furnace interest booked 5000 tons in the week. Automobile foundries, heating and ventilating equipment manufacturers and machine tool builders are the most active factors in the market. Prices are steady, and producers have not decided on quotations for fourth quarter.

Chicago—Better foundry operations are maintaining pig iron shipments at moderately above the rate a month ago. Heavier releases are scheduled for the latter part of August, while a further upturn in foundry melt is seen for September. Automotive foundries are busier in the production of new model parts, while farm implement manufacturers retain previous active schedules. Sellers have not announced when fourth quarter books will be opened nor are there definite intimations of prices for that period.

Boston—While pig iron sales have shown slight improvement, sellers are encouraged by better foundry operations indicating an early increase in small-lot shipments. Most small and average-sized foundries have little iron stocked, although the larger consumers are generally well covered. Prices for domestic iron are firm and are expected to be reaffirmed for next quarter.

New York—Pig iron sales are down from a week ago, and sellers generally look for real activity now until September. Business is com-

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prised almost entirely of small lots. Prices are expected to be reaffirmed for fourth quarter, with the possibility that some sellers may open books within the next few days.

Philadelphia—While probably less active than a week ago, pig iron continues to move in fairly good volume, chiefly carlot orders. Eastern pig iron sellers are expected to reaffirm present prices for fourth quarter.

St. Louis—Purchasing of pig iron continues active, and August shipments to date are slightly ahead of the similar period in July and substantially larger than a year ago. Demand is fairly diversified but as has been the case in recent months, relatively the best buyers are the specialty makers, notably farm implements, stoves, household appliances, machinery and air conditioning devices.

Buffalo—Pig iron demand is spotty. The general foundry trade has picked up to some extent but specialty works are off in their output and the general tone of the market in this district is not as good as in July. Seven stacks are active.

Cincinnati—Pig iron is moving to melters substantially above the July rate. New buying continues in small tonnages. Sustained operations by farm implement manufacturers remain a bright spot in the district.

Birmingham, Ala.—Shipments of iron outside of southern territory have improved. No intimation is given of any change in the base price of iron, as of today, $14.50 per ton, No. 2 foundry.

Toronto, Ont.—Minor tapering off in business is reported in the Canadian pig iron markets for the week. The decline in sales is credited to the usual seasonal slump and local blast furnace representatives look for a revival in business early next month.

Scrap

Scrap Prices, Page 65

Pittsburgh—A buying lull continued in the scrap market last week but apparently does not affect a continued strong undertone. Meanwhile railroad lists are supplying attractive prices as the Pennsylvania, Baltimore & Ohio, Erie and New York Central have recently been sold into the Youngstown district at around $14 for No. 1 heavy melting steel. The only quotable change of the week was a 50-cent per ton advance in machine shop turnings based on renewed buying interest by a down river mill.

Chicago — Scrap prices remain strong in the face of heavier offerings from outlying points. The top of the consumers' market for heavy melting steel remains $12.50, but sellers find it necessary to pay close to that figure in covering contracts. Shipments to mills reflect recent gains in consumption, but a quiet period in buying is in prospect. Foundry grades are strong and prices of some items have advanced further.

Cleveland—While buying of iron and steel scrap is confined largely to small lots and while some signs of price weakness had developed several days ago, a strong undertone is apparent.

At Youngstown, an advance of 25 cents a ton was registered on No. 1 and No. 2 heavy melting steel. Little new buying is being done except in small tonnages, one steelmaker being reported to have recently purchased a couple of thousand tons around $14 for No. 1.

Boston—Scrap prices are strong, more grades are active for domestic shipment and demand for export remains brisk. Heavy melting steel brings $9 and $8, delivered, New England consuming points, while dealers for export pay $9, dock, for No. 1 and up to $8.25 for No. 2. For Pennsylvania points heavy cast and machine turnings are firm with the former $5.75 to $6, shipping point, while up to $3 is paid for turnings. Stove plate is also firmer.

New York—Scrap prices are firm and unchanged, active grades making no additional advances. Shipments of heavy melting steel to eastern Pennsylvania, notably No. 2 from New Jersey, are substantial, and buying against export orders is steady on the New York side with scrap coming out less freely. From Chelsea, Staten Island, 21 shipping board ships, some of them 8000-10,000 tons will be scrapped by a Baltimore interest who purchased them a year or more ago, orders for the breaking up of which have been delayed.

Philadelphia—Scrap prices continue to tend strongly upward, with No. 1 steel now holding at $11.50, delivered consuming plant, and No. 2 at $10.50 to $11. Brokers are paying $11 and higher against orders taken at $10.50 and $11, delivered, actually taking a loss in covering on this business. Further, an eastern mill recently paid a railroad in this district $11.50 for No. 1 steel. As high as $11 has been paid recently for No. 2 steel, and a few other grades have undergone nominal advances. So strong has been the upward trend of late that it now appears doubtful if a district consumer could do under $12, delivered, for No. 1, and the chances are that he could not do much under $12.50. Later pressure may be relieved somewhat by resumption of operations by the Boston Iron & Metal Co., Baltimore, on the scrapping of shipping board boats. Eighty-five of these boats remain to be scrapped over the next two and a half years and will yield, it is estimated, 200,000 tons of iron and steel scrap.

Buffalo—The market for scrap is stronger in spite of the absence of tonnage purchases. Several dealers here claim to have offered $11.25 or upwards for railroad lists which closed this month but found the material which they desired moving to

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consumers on higher bids. On this basis the trade hopes for a $12 market for No. 1 heavy melting steel by the time next tonnage sales are made.

Detroit — Iron and steel scrap prices remain unchanged except for a 25-cent advance in new heavy auto and machinery cast, but the undertone is even firmer, and dealers view the fall with increasing optimism. Actual trading is a little quieter. Local consumers continue to buy from hand to mouth as needed.

Cincinnati — Dealers in iron and steel scrap are active although speculative dealing is modified. Quotions are unchanged. Mills continue resistance to tonnage purchases at current prices.

St. Louis—The market for iron and steel scrap has been featured by more active buying, higher prices and a general scarcity of material. An East Side mill purchased 3000 to 4000 tons of rails and specialties. As a result of this sale, prices of rails and some specialties were marked up sharply. The business was distributed among several dealers for delivery over three months.

Birmingham, Ala.—Quiet prevails in steel and iron scrap, with melters taking little and prices remaining unchanged.

Seattle—The domestic scrap market has responded slightly to firmer conditions in the East, but weakness of the export situation dominates local prices. The Orient is extremely quiet, China being entirely out of the market, and Japan, overstocked and hesitant, shows no interest. A local mill has been buying occasionally, this month reporting having taken 15 cars of No. 2 auto scrap, at $7.50 per gross ton, delivered.

Toronto, Ont.—Demand for iron and steel scrap is dull with only a few special grades moving. Minor shipments of heavy melting steel are being made to the Hamilton district but otherwise steel grades are at a standstill. Iron scrap also is in small demand. Dealers are out of the market and prices are unchanged.

Warehouse

Warehouse Prices, Page 66

Pittsburgh—Jobbers still are experiencing a proportionately good demand for steel products out of stock. August shipments should at least equal those of July. The price schedule for both in-town and out-of-town Pittsburgh shipment is unchanged.

Cleveland—Orders are holding to a slightly better volume than in July, with buying well distributed. Extras on steel bars are to be put in effect shortly, in line with the recent announcement on mill prices. Cold-finished steel prices also are expected to be strengthened.

Chicago—Sales make a favorable comparison with the rate a month ago as a result of a recent upturn in demand from both city and country buyers. An even larger gain is shown over the volume of a year ago. Prices are unchanged.

New York—Warehouses have adjusted bar extra prices in line with recent mill changes. Sales volume holds to the recent rate, a few jobbers reporting improvement, with better distribution. Competition is intense, with some irregularity in prices due in part to shopping, broker sales and imported steel.

Boston—Warehouse volume is sustained, with demand well spread. Jobbers have revised size extras on forging quality and other bars, following recent adjustments in these extras by mills.

Philadelphia—Jobbing demand is being fairly well sustained, with resellers generally looking for a good improvement this fall. Prices are un-

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changed except for revisions in bar extras to conform with changes recently put into effect by the mill.

Detroit—Warehouse business in iron and steel is running at a higher level than in July, which is encouraging considering the season. The changeover in automobile models is chiefly responsible, although business has a wide spread. Prices remain steady.

Cincinnati—Industrial plant rehabilitation and expansion account for good tonnages of steel from warehouses, total volume this month being at the July rate. Changes in bar size extras, to accord with mill announcements, probably will not be adopted this month.

St. Louis—Iron and steel warehousemen report business well sustained, with the usual summer drop less than for several years. There has been more life in heavy rolled products than heretofore, though interest still centers on the lighter materials.

Seattle—Wholesale jobbers find August volume showing a large increase over July. All items are moving freely. Prices are steady.

Semifinished

Semifinished Prices, Page 63

Due to the fact that billet producers have been called upon in increasing instances to furnish forging quality billets in under 6 x 6-inch sizes to the same exacting requirements as are applicable to bars, Republic Steel Corp. last week took the initiative on reclassifying the definition of base. Effective with Aug. 20, the dividing line between carbon billets and bars of forging quality will be 6 x 6, instead of 4 x 4-inches. At the same time the base price was announced for a $3 a ton advance to $35, basing points. Henceforth, billets from 6 x 6 down to 5 x 5 inches, will take $2 a ton extra; then 4 x 4 sizes will go on the bar card. Extras for chemistry, cutting, etc. are all unchanged. Other leading producers have announced the same adjustments.

Although other semifinished steel price changes are in contemplation, especially as regards extras for special requirement steels, there have been no recent announcements affecting common wire rods at $38, Pittsburgh, combination rods at $40, sheet bars at $28 and rerolling billets at $27 a ton.

Tin Plate

Tin Plate Prices, Page 62

New York—Tin plate specifications continue to taper as is usual at this season of the year. Prices are unchanged.

Pittsburgh—Lateness of many canning crops is the backbone for sustaining buying by the canmakers, but most tin plate mills, which on the average are running some 85 per cent, have scarcely any order backlogs. Mill inventories of finished tin plate awaiting shipment are being steadily reduced, but the movement is not rapid and there is a possibility that stocks may be carried over into 1936. The market continues to be $5.25 per base box, Pittsburgh, on tin plate and 2.75c, Pittsburgh, on tin mill sizes of black plate.

Philadelphia—Carroll-McCreary & Co. Inc., Long Island City, N. Y., have been awarded 15,000 sheets No. 30 gage terne plate, each 36 x 96 inches, for the Frankford, Pa., arsenal at 6.41c, delivered, bids Aug. 7.

Youngstown, O.—Practically all the tin plate requirements for the current canning season having been rolled and delivered, mills in this district now are operating around 50 per cent. This situation is entirely seasonal, coming a bit earlier this year because buyers started placing in January definite orders for material usually placed late in the preceding autumn, thus enabling most tin mills to have operated through the spring and summer around 100 per cent. Apparently so satisfactory has this new arrangement turned out for both canners and mills that it may be followed up in the next buying campaign, it is said. Miscellaneous orders including beer can requirements, are keeping up the mills' current activities.

Metallurgical Coke

Coke Prices, Page 63

Beehive coke in all grades is quiet, with prices unchanged at $3.25 to $3.40 for furnace grades, $4 to $4.10 for plain foundry and $5 to $5.10 for premium grades, all at Connellsville, Pa., base. Melters in the Pittsburgh district have heavy stocks and buying will be deferred. Chicago cokemakers' shipments in August are moderately larger than in July, with prices unchanged. In the St. Louis district the rate of coke consumption is heavier than usual for summer. Prices and rate of shipment at Birmingham, Ala., are steady.

Specifications for by-product foundry coke show improvement at Cincinnati. A quotation of $9, delivered, Cincinnati, is available for local users, on freight rate concessions attributable to barge competition.

Ferroalloys

Ferroalloy Prices, Page 64

New York—Ferromanganese shipments this month, according to trade estimates, will exceed those for either July or June, notwithstanding the possibility that steelmaking may level off over the remainder of the month. Domestic prices are unchanged at $85, duty paid, Atlantic and Gulf ports, with the possibility they will be reaffirmed, despite lower offerings from abroad, some of which have resulted in the filing of a complaint

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against German sellers of dumping.

Within the past 60 days two lots of German ferromanganese, totaling around 1500 tons, have been received at Baltimore, the latest lot arriving about two weeks ago, and of this total, it is said, between 1300 and 1400 tons have been shipped to the Youngstown, O., district, with the remainder placed in storage in Baltimore for distribution later.

The complaint of dumping, it is understood, has failed so far, it being contended by the treasury department in Washington that the charge was not supported.

Domestic spiegeleisen, 19 to 21 per cent, is unchanged at $26, Palmerton, Pa., on lots up to 50 tons and $24 on 50 tons and over. Sellers have not as yet announced their prices for last quarter and are expected to await action on ferro-manganese.

Coke By-Products

Coke By-Product Prices, Page 63

New York—Demand for distillates is steady with current output moving directly in consumption, there being a shortage with some distributors who are unable to take spot business. Industrial demand for benzol has improved. Contracting for sulphate of ammonia is seasonally active and spot demand is fairly good. Naphthalene business is confined to spot shipments with little advance covering. Prices are steadier. Some increase in industrial chemical demand for phenol has developed. Prices are unchanged.

Nonferrous Metals

Nonferrous Metal Prices, Page 64

New York—Sharp declines in tin and the development of strength in copper and zinc featured nonferrous metals last week.

Copper—Undertone of the market was strong with some sellers expressing bullish price sentiments toward the end of the week. Some observers anticipate a possible price rise if consumption and buying hold up next week. All sellers quoted 8.00c, Connecticut, last week for electrolytic.

Zinc—A number of sellers were reluctant to do business toward the end of the week at current levels while others were practically out of the market and unwilling to dip into stocks. The tone was strong with the market apparently on the verge of an early price rise if current demand continues. Sellers last week quoted 4.50c, East St. Louis, for prime western.

Lead—Some trade interests predict that a buying wave for September metal will get underway this week. Prices were firm at 4.20c, New York, and 4.05c, East St. Louis.

Tin—Tin prices dropped sharply as a result of the International Tin committee's action increasing export quotas to 65 per cent. Backwardation was narrowed to a small margin in London. Straits spot tin closed around 48.75c against 52.10c immediately before the quota increase. Outlook in the tin market is brighter.

Antimony—Fair tonnage of antimony was sold at unchanged prices on the basis of 13.00c, duty paid, for Chinese spot.

Steel in Europe

Foreign Steel Prices, Page 66

London — *(By Cable)*—Production of pig iron and of steel ingots and castings in Great Britain in July showed an aggregate gain. Output of pig iron in July was 547,300 gross tons, a daily rate of 17,655 tons, compared with 529,300 tons in June, at a daily rate of 17,643 tons. Active stacks at the end of July

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numbered 98, compared with 97 at the end of June.

Steel ingot and castings output in July was 803,300 gross tons, a daily rate of 29,750 tons, compared with 770,000 tons in June, a daily rate of 30,800 tons.

Market conditions in Great Britain are unusually brisk for midsummer and as pig iron producers have booked orders sufficient to cover production to the end of the year an increase in production is expected. Trade in semifinished steel, rails and structurals is active and demand for ship plates is improving, including needs for export.

It is reported the three months quota of Continental steel bar imports into Great Britain under the new trade agreement is almost reached. Continental bars have sold into the Midland district at £7 5s. delivered.

Export trade from the Continent is said to be fairly good, Berlin reporting increased trading with South America. Krupps has booked a contract for locomotives for India.

Why National Net Is Large

(*Concluded from Page* 13)

the picture: National Steel's products. The company is able to produce 953,550 tons of finished hot-rolled products at Weirton and 950,000 tons of hot-rolled products at Great Lakes works, or 1,903,550 tons of rolled steel products yearly between these two works and out of a rated basic steel ingot capacity of 2,232,000 tons.

Of this total of 1,903,550 tons of finished hot-rolled, the company can offer 603,000 tons in scrap and 505,800 tons in hot-rolled sheets, or 1,108,800 tons of the total in the so-called light flat-rolled steels. Of this latter figure it can, of course, produce cold strip, cold-finished sheets, galvanized sheets, etc., all of these latter grades representing further processing on the hot-rolled capacity. Tin plate capacity for National Steel, between Weirton, Steubenville, O., and Clarksburg, W. Va., works, aggregates some 300,000 tons and also comes out of hot-rolled sheets.

The remainder of National's capacity is made up of bars (365,750 tons), of shapes (100,000 tons), of plates (100,000 tons), of tie plates and angle bars (87,000 tons), and of railroad spikes (6250 tons).

But, it can be seen that better than half (1,108,800 tons to a total of 1,903,550 tons) is in light flat-rolled material.

Market history of the last five years has repeated over and over again the preponderant use for sheets and strip as against the "heavier rolled products." The company's Great Lakes division, being in Detroit with the automobile industry, has shared in that industry's rapid rise out of depression depths. Stability to demand for tin plate has aided the Weirton division of National Steel. The growing multitudinous uses for strip, both in the automotive industry, general manufacturing and miscellaneous fields, have been noteworthy.

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Equipment

New York — Machine tool inquiry is active with incoming orders steady. Demand is more diversified from a broader range of industries. Several cranes will be required for two incinerators under contract for New York city. Outstanding is an inquiry for 19 lathes for the Philadelphia navy yard including one 36-inch vertical, 15 universal and three toolmakers' lathes.

Chicago—Machinery and plant equipment sales are steady. Sellers are becoming more optimistic regarding fall prospects in view of the absence of the quietness which ordinarily develops during the summer months. Sales lately compare favorably with the rate a month ago and in several instances are well ahead of the 1934 volume. Inquiries show a trend similar to that in ordering and in most instances result in prompt purchases. Well sustained demand for small tools reflects the steadiness in operations of most metalworking plants. Machine tool lists generally are small individually, with railroad shops still conspicuously lacking in both orders and inquiries.

Boston—While some machinery builders note a slight decline in new domestic orders, others have booked some attractive foreign volume. Builders of heavier equipment are more active on accumulated orders and most of the larger shops have fair backlogs. In some instances exhibitors are rushing through models for the Cleveland show and New England will be heavily represented. Orders for equipment to be used for the tidal power project at Eastport, Me. —graders, mixers, shovels and other outdoor units—are being awarded, mostly to midwest shops.

Seattle—Machinery and equipment continue in active demand, both for new and used goods. Navy yard construction and enlarged mining and industrial operations in Alaska are calling for many items. Resumption of logging and lumber manufacture and reopening of mining properties in Alaska are giving impetus to the market.

Wellman Engineering Co., Cleveland, has been awarded boat and airplane cranes for the cruisers BROOKLYN, PHILADELPHIA, and HONOLULU, costing $56,688.

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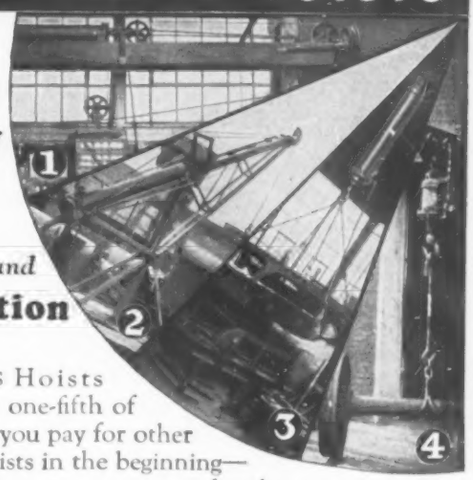

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Construction and Enterprise

Illinois

ALTAMONT, ILL.—City has applied to PWA for a grant and loan of $45,000 for improvements to municipal light and power plant.

AVA, ILL.—City has made application to PWA for grant and loan of $41,000 for erecting modern waterworks system.

CAMPBELL HILL, ILL.—City has applied to PWA for a grant and loan of $28,000 for waterworks system.

CASEYVILLE, ILL.—City is seeking PWA grant and loan of $38,000 for waterworks system.

CHICAGO — Perfection Service Corp., 205 West Wacker drive, has been incorporated by Frank F. Smead, C. A. Nelson and George M. Galloway, to manufacture and install heating, ventilating, air conditioning and allied equipment. Correspondent: William E. Rodriguez, 1100 Burnham building, 160 North LaSalle street.

MT. OLIVE, ILL.—Bids will be received Sept. 4 by the city on construction of waterworks and distribution system improvements, including pumps, tank on tower, etc. Cost estimated at $115,000.

O'FALLON, ILL.—Improvements to the sewage disposal plant to cost about $25,000 are planned by the city, including installation of secondary treatment equipment and auxiliary piping and appurtenances.

WAUKEGAN, ILL. — Johns-Manville Inc., manufacturer of asbestos products, has awarded contract for construction of two additions to factory, one 50 x 650 feet, and another 100 x 200 feet, both 40 feet high.

Ohio

ASHLAND, O.—A. L. Barber Co., manufacturer of printing and paper boxes, is constructing an addition to its plant.

CANTON, O.—Timken Roller Bearing Co. is removing its department for making rock-drill bits from Canton to Mt. Vernon, O., occupying the old Hope works.

CLEVELAND—Automotive Products Co., 3000 Woodhill road, making replacement parts for automobile motors, is purchasing machine tools for its Cleveland plant, and will buy some rubber-working machinery for the plant it has leased in Salem, O.

FOSTORIA, O.—Fostoria Screw Co. is doubling production at its plant here, using in part, machinery it is getting from a dismantled works, and it is probable there will be some new tools purchased.

GIBSONBURG, O.—National Mortar & Supply Co. has an extensive building and remodeling program under way. The company will erect three large bins for storage of hydrated lime, two others for storage of raw crushed lime and a pulverizing lime unit.

Michigan

ANN ARBOR, MICH—George Sandenburg, city engineer, is taking revised figures for the sewage disposal plant to be erected here. Estimated cost $550,000. New bids are due Aug. 28.

DETROIT—Monte Detroit Corp., 4456 Cass avenue, has been organized to engage in general manufacturing, by Peter Kaldes, 1309 West Grand boulevard.

DETROIT — General Motors Corp., General Motors building, has under way a program of plant renovation and expansion involving the purchase and installation of new machinery, tools and equipment, and will involve an expenditure of $50,000,000.

FLINT, MICH.—Gorney Brewing Co., recently organized, has acquired a building at Walnut and Poplar streets, with about 60,000 square feet of floor space, and has begun alterations preparatory to the installation of equipment.

LUDINGTON, MICH. — Thompson Cabinet Works has awarded contract to O. Nelson, Ludington, for the erection af a factory building.

Indiana

INDIANAPOLIS—Mid-West Industries Corp., 1717 Gent avenue, has been formed to manufacture metal products, by Glen Chaille, Russell H. Chaille and Frank Chaille.

KOKOMO, IND.—American Dirigold Corp., 1142 South Main street, has been formed to manufacture metals, alloys, etc., by Robert Arnett, Carl Molin, John P. Frederick, Glen R. Hillis and Virgil L. Coffel.

NOBLESVILLE, IND.—Real estate, machinery and equipment of the Union Sanitary Works, including foundry equipment, motors, machine shop equipment, etc., will be sold at auction Aug. 20, under direction of Michael Tauber & Co., 411 South Market street, Chicago, auctioneer.

Pennsylvania

LEECHBURG, PA.—West Leechburg Steel Co., Union National Bank building, Pittsburgh, will install a new craneway and a 10-ton crane in connection with re-arangement of plant facilities here, incidental to erection of a new single-stand 4-high cold strip mill which is expected to be in operation by Nov. 1.

McKEES ROCKS, PA. — Socony-Vacuum Oil Co., 26 Broadway, New York, will build a loading dock on the Ohio river here.

PITTSBURGH—Damascus Bronze Co. plant, 928 Shore avenue, sustained damages by fire Aug. 8.

PITTSBURGH — Elkhorn Piney Mining Co., Koppers building, will build a river loading terminal on the left bank of the Kanawha river. A 36-inch belt conveyor system is included among improvements.

Connecticut

WATERBURY, CONN.—Waterbury Tool Co. has awarded general contract for a plant building, one story, 30 x 290 feet, to Allyn Wadhams Co., Hartford, Conn. Additional equipment will be purchased for the new unit.

Massachusetts

BOSTON—H. L. Hauser Building Co. Inc., 29 Bay street, has been awarded general contract by the Boston Wharf Co. for a loading platform and garage. Loading and conveying equipment will be purchased.

New York

NEW YORK—Port of New York Authority closes bids Sept. 12 on fans, motors and transmissions for the Hudson midtown tunnel under the Hudson river connecting Weehawken, N. J. and Manhattan.

WATERLOO, N. Y.—Waterloo Mills Inc., manufacturer of woolen fabrics, idle for more than a year, has been purchased by Allen L. Goldfine, New York, from the Voight Mfg. Co., Rochester, N. Y. Several months will be required for alterations and installation of modern machinery.

Alabama

MILLPORT, ALA.—Town, Ward P. Miller mayor, plans waterworks, including erection of pump house and treatment plant, and installation of two 50 gallon-per-minute pumps with motors.

Maryland

FREDERICK, MD.—City, Lloyd C. Cyller mayor, has had grant of $452,295 approved by federal government for constructing sewer system.

District of Columbia

WASHINGTON — Department of interior, purchasing officer, will take bids Sept. 5, proposal 897, on installation of power plant equipment at a Navajo capital power plant in New Mexico.

WASHINGTON—Bureau of supplies and accounts, navy department, will take bids Aug. 27, schedule 5758, two motor-driven toolmakers' lathes; schedule 5759, one motor-driven tool room lathe, all delivered Philadelphia; Sept. 3, schedule 5761, 60 portable electric drills, delivered Mare Island, Calif.

WASHINGTON—District commissioners, 509 District building, receive bids Sept. 4 for unit No. 10 of sewage treatment plant at Blue Plains. Work consists of constructing sludge dewatering, power plant and administration building and substations. Specifications may be obtained from office of chief clerk, engineer department, room 427 District building.

Virginia

CLARENDON, VA.—County board of Arlington county receives bids Sept. 11 for constructing following projects: Contract No. 20, sewage disposal plant, consisting of screen building and pumping station, primary settling tanks, sludge digester and storage tanks; contract No. 23, construction of sewage lift station, including furnishing and erecting pumping equipment, piping, valves, electrical work, etc.

MIDDLEBURG, VA.—Town has applied for federal funds for constructing sewage disposal plant and also for funds to install a water supply system.

Missouri

JEFFERSON BARRACKS, MO. — Veterans administration, Washington, is to receive bids Aug. 20 on new boilers, stokers and other equipment for boiler plant at veterans facility here.

MONTGOMERY CITY, MO.—City is seeking a $20,000 PWA grant for waterworks improvements and rehabilitation.

SAVANNAH, MO.—City, W. O. Swenson mayor, will install a $105,-

(*Please turn to Page* 88)

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(Concluded from Page 86)

000 sewer system, comprising an Imhoff tank type disposal plant, filter bed and general settling tank, sludge pumps, etc.

Arkansas

DANVILLE, ARK.—City has applied to PWA for $42,000 loan for erection of waterworks system.

Oklahoma

ADA, OKLA.—Harwell-Parks Machine Co. Inc. has been chartered with $20,000 capital by C. C. Harwell and Rex Parks.

OKLAHOMA CITY, OKLA.—Clark Bottom Hole Intermitter Co. has been incorporated with $32,000 capital to manufacture oil well equipment, by William L. Clark, First National building.

OKLAHOMA CITY, OKLA.—Green Head Bit & Supply Co. has been incorporated with $25,000 capital, to succeed Snetcher & Pittman Inc., manufacturer of oil field tools.

TULSA, OKLA.—Nelson Electric Mfg. Co., C. B. Nelson president, 712 South Main street, plans erection of plant for manufacture of electrical specialties for the oil fields.

TULSA, OKLA.—Magic Pump & Mfg. Co. has been incorporated with $10,000 capital to manufacture oil field pumps, by A. G. W. Biddle, care of Seismograph Service Corp., Kennedy building.

Texas

BEAUMONT, TEX.—Twin Seat Valve Corp. has been incorporated with $10,000 capital, by E. H. Robertson, 185 Anchor street.

BEAUMONT, TEX.—Oil City Brass Works, 326 Neches street, has added a forge shop, 50 x 130 feet, to its plant, for manufacture of nonferrous castings and products.

DALLAS, TEX.—D. & B. Pump Co. is building a 70 x 90-foot addition to its machine shop here for manufacture of oil well pumps.

DALLAS, TEX.—Continental Welding Co. has established an electric and acetylene welding shop at 1604 Cedar Springs street.

HOUSTON, TEX.—Mission Mfg. Co., manufacturer of oil field supplies, has completed a new plant, 100 x 138 feet, including machine shop, forging and heat treating department units. Total cost $75,000.

PALESTINE, TEX.—City, Harvey B. McAllister consulting engineer, Waco, Tex., has applied for $75,000 PWA loan to build a sewage disposal plant.

PARIS, TEX.—City, J. Morgan Crook mayor, receives bids Aug. 19 for furnishing material, apparatus, appliances, tools, equipment and constructing two sewage treatment plants.

Wisconsin

CHIPPEWA FALLS, WIS.—County board is letting contracts for erection of 1-story addition, 60 x 100 feet, to county highway garage, service station and warehouse on East Grand avenue, costing about $40,000 complete. W. H. Taylor is county highway commissioner.

LODI, WIS.—Application has been made for PWA grant for building sewerage system and disposal plant costing $74,000. W. G. Kirchoffer, 22 North Carroll street, Madison, Wis., is consulting engineer.

MILWAUKEE — Advance Plating Co., 1739 North Twelfth street, has leased a building at 516 West Highland avenue for extension purposes.

MILWAUKEE—Kirchhoff & Rose, architects, 710 North Plankinton avenue, are taking bids for construction and alterations in Milwaukee plant of Pittsburgh Plate Glass Co., for which appropriation of $300,000 is available.

MILWAUKEE—Peters Tool Co., 2161 South Kinnie avenue, has been incorporated by Henry, Charles and Laura Peters.

MILWAUKEE—Wisconsin Boat & Engine Co. has been incorporated by George and Florence Barnek and Charlotte Sherkow.

Minnesota

ST. CLOUD, MINN.—St. Cloud Brewing Co. is making alterations and extensions to brewery facilities, including construction of a garage and warehouse and installation of additional equipment.

WILLMAR, MINN.—L. G. Foley, chairman of state board of control, State office building, St. Paul, will take bids until Aug. 20 for improvements to boiler plant at state asylum here, including installation of new water tube boiler and stoker. G. M. Orr & Co., Baker building, Minneapolis, engineer.

WINONA, MINN.—Peter Bub Brewery Inc. has been incorporated with a capital stock of 4000 shares of no par value to operate a brewery, by William F. Miller, Helen Walter and Margaret Olson. The brewery is at present undergoing a large expansion program.

South Dakota

MADISON, S. DAK.—City council has awarded contract to Busch-Sulzer Diesel Engine Mfg. Co., St. Louis, for a 1000-horsepower four-cycle generating unit for municipal light and power plant at a cost of about $55,000.

WILLOW LAKES, S. DAK. — Dakota Engineering Co., Western building, Mitchell, S. Dak., has prepared plans for a municipal waterworks and sewer system, including a 50,000-gallon steel water tank on a 100-foot steel tower, four miles of water mains, pump house and turbine pump, to cost about $50,000.

Iowa

DUBUQUE, IOWA—Maj. R. A. Wheeler, district engineer, Clock Tower building, Rock Island, Ill., will take bids until Aug. 30 for replacing Eagle Point bridge at dam No. 11 in the Mississippi river, consisting of 820 square feet of steel sheet piling, 335 tons of structural steel, and 28 tons of reinforcing steel.

FORT DODGE, IOWA—W. A. Klinger Inc. was awarded contract to build a $45,000 addition to the new Tobin Packing Plant here.

IOWA CITY, IOWA—City's application for grant of $415,000 from PWA for financial aid in constructing its new municipal electric light plant has received approval.

NASHUA, IOWA—City officials are considering the construction of a sewage disposal plant.

RENWICK, IOWA—Bids will be taken Sept. 4 by city for construction of improvements to the municipal electric light and power plant. Installation of one diesel engine is proposed.

SIOUX CITY, IOWA—Sioux City Brewing Co. has awarded contract for installation of new bottling machinery and equipment in bottling house. Other improvements to brewing plant are contemplated.

Pacific Coast

HUENEME, CALIF.—A. Schroeder, 300 G street, Oxnard, Calif., has been awarded contract by the Oxnard Citrus Association, J. D. McGrath president, for erection of a lemon packing plant to have over 100,000 square feet. The building, includ[ing] equipment, will cost approxim[ately] $200,000. Construction will st[art] Sept. 1.

NAPA, CALIF.—Rough Rider Mfg. Co., Nathan Bothman proprietor, 175 Twelfth street, San Francisco, plans construction of a new factory here, costing $24,000.

LOS ANGELES—Architects Henry Carlton Newton and Robert Dennis Murray, 502 Architects building, are taking bids for a machine shop building to be erected for the Republic Supply Co., 2122 East Seventh street.

LOS ANGELES—Magnus Co. Inc., 860 North Main street, has started construction of a nonferrous brass foundry in the Bandini industrial district. The building will be one story, containing 42,000 square feet. Total investment of the buildings, property and equipment will approach $150,000, and the plant's capacity will be 1,000,000 pounds a month. Fred K. Czerniski is general manager here.

GRANTS PASS, OREG.—Warren Northwest Inc., Portland, Oreg., has the general contract for the local sewage disposal plant for which PWA loan and 30 per cent grant of $45,000 have been approved. Baar & Cunningham, Portland, are consulting engineers.

SEATTLE—Rogers Diesel Engine Co. has been organized with $50,000 capital by Frank S. Rogers, 1308 East Pike street.

SPOKANE, WASH. — Frank G. Sutherlin, commissioner public utilities, announces the city plans construction in the near future of the proposed $330,000 South Side pumping station.

TACOMA, WASH.—Fire did considerable damage to the veneer, plywood plants of the Wheeler-Osgood Co. Aug. 7. Rebuilding has begun, and new equipment may be required.

Dominion of Canada

COPPER CLIFF, ONT.—International Nickel Co. of Canada Ltd., Dr. John F. Thompson, vice president, reports increased industrial uses of nickel in Great Britain and on the Continent has necessitated both plant expansion in the refinery at Clydach, Wales, and construction of a new research and experimental laboratory at Birmingham, England. Total expenditure estimated at $750,000.